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PART I
S. Hrg. 104–422

GLOBAL PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

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PT. 1
Global Proliferation of Weapons of...

HEARINGS

BEFORE THE

PERMANENT
SUBCOMMITTEE ON INVESTIGATIONS

OF THE

COMMITTEE ON
GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

ONE HUNDRED FOURTH CONGRESS

FIRST SESSION

PART I

OCTOBER 31 AND NOVEMBER 1, 1995

Printed for the use of the Committee on Governmental Affairs

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GLOBAL PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

TUESDAY, OCTOBER 31, 1995

U.S. SENATE,
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Permanent Subcommittee on Investigations met, pursuant to notice, at 9:36 a.m., in room SD–342, Dirksen Senate Office Building, Hon. Ted Stevens presiding.

Present: Senators Stevens, Nunn, Cohen, Glenn, Dorgan, and Akaka. Also present: Senator Lugar.

Staff present: Daniel S. Gelber, Chief Counsel to the Minority; John Sopko, Deputy Chief Counsel to the Minority; Alan Edelman, Counsel to the Minority; Mark Webster, Investigator to the Minority; Mary Robertson, Assistant Chief Clerk to the Minority; Richard Kennan (Detailee, U.S. Customs); Renee Pruneau-Novakoff (Detailee, CIA); Harold Damelin, Chief Counsel and Staff Director; Eric Thorson, Chief Investigator; Michael Bopp, Counsel; Stephen H. Levin, Counsel; Ariadne Allen, Investigator; Jack Cobb, Counsel; Christopher Greer, Investigator; Susanne Horner, Librarian; Mary Ailes, Staff Assistant; Carla J. Martin, Chief Clerk; Ken Myers (Senator Lugar); Dan Bob (Senator Roth); John Roots (Senator Stevens); Jim Bodner (Senator Cohen); Al McDermott (Governmental Affairs Committee); Christine Ciccione (Governmental Affairs Committee); Matt Sikes (Senator Nunn); Rick Valentine (Senator Smith); Nina Bang-Jensen (Senator Lieberman); Debra Wada (Senator Akaka); Len Weiss (Governmental Affairs Committee); Randy Rydell (Governmental Affairs Committee); and Tom Griffith (Senate Legal Counsel).

OPENING STATEMENT OF SENATOR STEVENS

Senator STEVENS. My apologies for being late. All the tour people are in from Alaska, and 25 people for me is like 5,000 people for you, Sam.

Let me thank all of you for being here. The Subcommittee is going to continue a series of hearings on the serious and growing worldwide threat that is posed by the proliferation of weapons of mass destruction, which encompass chemical, biological, and nuclear weapons, and weapons material. These hearings today and tomorrow will focus specifically on the risks resulting from the proliferation of chemical and biological weapons by examining as a case study the sarin gas attack on a Tokyo subway station by the Japanese cult known as Aum Shinrikyo.

Senator Roth is unable to be here today. He is the Chair of the Permanent Subcommittee. We will put Senator Roth's statement in the record at the beginning of this hearing.

[The prepared statements of Senator Roth and Senator Akaka follows:]

PREPARED STATEMENT OF SENATOR WILLIAM V. ROTH, JR.

A new era in the use of weapons of mass destruction is upon us. Consider that the same substances used in certain detergents, ceramics and even pen ink are key ingredients to lethal chemical weapons. Consider also that deadly biological agents may be extracted from seemingly-innocuous plants, may be produced in the laboratory in almost unlimited quantities, and may be ordered from private suppliers for ostensible research purposes. With these facts in mind, understand that madness has recognized the deadly simplicity and availability of chemical and biological weapons, and is reaching to these agents as its newest method.

This Subcommittee has a longstanding history of investigating and exposing the problem of weapons proliferation. The record we have created chronicles the spread of chemical and biological weapons throughout the world, the threat to domestic and global security posed by the conventional arms bazaar, and the black market for nuclear materials. Today we turn reluctant eyes to another page from this somber compendium

The chapter we now examine is perhaps the most chilling. It describes the horrible potential of chemical and biological weapons that we first examined back in 1989. Today, after a religious cult in Japan known as the "Aum Shinrikyo" cruelly and barbarously unleashed this horrible potential on innocents, we must revisit this subject. What was once science fiction is now reality.

This hearing focuses on the Aum Shinrikyo as an example of what can happen when madness finds a method. The madness, in this case, began with a man named Shoko Asahara, a disaffected yoga instructor who formed a religious cult in the mid-1980s and named it Shinrikyo, or "supreme truth" in Sanskrit. The cult was devoted to Siva, the Hindu god of destruction and reproduction, and predicted Armageddon in 1997. It attracted up to sixty-five thousand members worldwide, including an estimated ten thousand followers in Japan, more than thirty thousand in Russia, and numerous others around the rest of the world, including in the United States.

In the late 1980s, the Aum secured protected status as a religious corporation and began amassing large quantities of cash, land and other assets through questionable means. Asahara organized the cult by establishing a ministerial cabinet patterned after the Japanese government.

Its finances and structure in place, the Aum turned its attention to finding a method through which it could carry out Asahara's mad ambitions. The Aum is alleged to have engaged in a bewildering number of sinister activities, which can be divided into three categories. The first consists of the Aum's elaborate, malicious preparations. These included a uranium-mining and chemical-testing expedition to the Australian outback where Aum scientists experimented with sarin on sheep; an attempt by the cult's office in New York to purchase a highly sophisticated laser device capable of measuring plutonium; the construction of factories to manufacture chemical, biological, and conventional weapons; and the development of a microwave device the size of a refrigerator to dispose of bodies, and a laser cannon for use against the Tokyo police.

The second category is comprised of attempts to murder innocent civilians and government officials. In addition to other attempts, the Aum spread anthrax bacteria from the top of a Tokyo building; deployed briefcases containing small fans intended to spread chemical and biological agents in covert fashion; and, in a Tokyo subway restroom, set on fire two plastic bags of chemicals, which, had they not been found quickly and extinguished, would have combined to produce a cloud of deadly hydrogen cyanide gas.

The third category is comprised of actual killings allegedly committed by the Aum. Among these are the grisly tale of a remodeled two-ton truck spraying sarin in a residential area of Matsumoto resulting in seven deaths and five hundred injured; the March 20, 1995 Tokyo subway gassing resulting in twelve deaths and five thousand injured; and the murder of both cult "enemies" and disobedient followers by lethal injection.

Perhaps the most obvious lesson we can learn from the Aum is this: Chemical and biological weapons can be produced and deployed by organized, well-funded and scientifically-knowledgeable groups. A related concern is that, if a group cannot produce chemical or biological weapons itself, it may find them for sale.

The conditions for the creation of a chemical and biological weapons black market appear to exist already. The Department of Defense reports that dozens of countries have some biological and/or chemical systems capabilities. Russia alone has an estimated stockpile of forty thousand metric tons of chemical weapons protected by security systems described as "rudimentary." A recent article in the *Washington Times* notes that a former Soviet military office is under investigation for aiding in the shipment of nearly a ton of chemical substances to unidentified Middle East buyers in 1993.

This summer, Iraq admitted to having developed a large biological weapons program. More recently, Iraqi officials have been accused of withholding information from a United Nations group monitoring the disposal of these weapons.

Here in the United States, I think we have been surprised to find ourselves more than simply spectators to these troubling events. Earlier this year, two men in Minneapolis were convicted of possessing ricin, a biological toxin twice as lethal as the deadliest cobra venom. Also this year, a Columbus, Ohio man allegedly obtained three vials of bubonic plague bacteria from a private supplier of biological cultures. And with sadness, we remember the tragedy in Oklahoma City, where agricultural fertilizer was mixed with fuel oil to create an explosion our nation will never forget.

We must squarely address the face of terrorism by working diligently to prevent the unlawful diversion and production of chemical and biological weapons. Globally, it may be time to refine our arms controls conventions to better counter the threats posed by terrorist organizations. Domestically, the Senate has passed an anti-terrorism measure designed to help law enforcement agencies thwart terrorist attempts and to stiffen the penalties on such reprehensible activities. The idea is to bolster both prevention and deterrence, and it is a good one. This measure should become law.

Terrorist groups like the Aum Shinrikyo rely upon anonymity and surprise in order to accomplish their objectives. I believe that through hearings such as this we help raise awareness of terrorism, its objectives, and its methods. Our message is not just to beware, but to be *aware* of terrorist methods in order to halt these organizations before they act.

I commend the distinguished ranking member, Senator Nunn, and his staff for their efforts to bring these problems to the public's attention. For years, my colleagues, Senators Nunn and Lugar, have warned of weapons of mass destruction with clarion voice, and their efforts deserve our praise.

I also thank the Japanese and Tokyo governments for their cooperation with the Subcommittee. They have done our country a great service in helping to shed light on the Aum Shinrikyo and its perverse pursuits.

Before closing, I want to point out a fundamental challenge groups like the Aum present to Japan, the United States and the rest of the democratic world. The challenge is to strike a balance between security and associational and religious freedoms. We must pursue domestic security with care, so that we do not sacrifice freedoms central to democracy.

PREPARED STATEMENT OF SENATOR DANIEL K. AKAKA

Mr. Chairman, today's hearing focuses on a profound threat to world peace—the proliferation of weapons of mass destruction. The use of chemical, biological and nuclear weapons and the procurement of materials to manufacture these weapons, particularly by terrorist organizations, pose a significant threat to our national security, as well as to peace efforts around the world.

One only has to look at the Middle East to see that delicate efforts to bring peace to the region are being threatened by fringe terrorist groups. The Japanese cult, Aum Shinrikyo, is another example of the potential threat that the United States and our allies face. The bombing of the World Trade Center and the Oklahoma Federal Building and the derailing of an Amtrack train in Arizona show only to clearly the threats we face here in the United States. Today's hearing will show that Americans are not immune to the growing threat posed by the proliferation of chemical, biological and nuclear weapons. The time has come for us to confront this issue and to determine a course of action to respond to this rising specter of danger.

The ratification of the Chemical Weapons Convention would be the first step to ensure that future generations of Americans are safeguarded from the horrors of chemical weapons. It can also serve as a model for other arms control and verification treaties.

Senator Stevens, I am pleased to be here today, and I commend Senator Nunn and Senator Roth for their leadership in this area. I look forward to learning more about the threat from weapons of mass destruction to our country and the world.

Senator STEVENS. On March 20 of this year, the world was stunned by the sarin gas attack in the Tokyo subway station that killed 12 people and injured over 5,000. I think there is no question that these weapons are menacing because countries or individuals seeking mass destruction capability find them relatively cheap to produce and do not demand the elaborate technical infrastructure needed to make nuclear weapons.

These hearings raise very timely and important questions, both for the world community and for our Nation. We have seen all too clearly that we are not immune from terrorist acts. This investigation has been conducted by the Subcommittee's minority staff, and I commend the Subcommittee's ranking minority member, Senator Nunn, and his staff for the outstanding work they have done on this important investigation.

Senator Lugar, I am please very much to have you here. While not a Member of this Subcommittee, we also commend you for the fine work you have done in this area. You have a long-standing commitment to this important issue, and I appreciate the attendance of the witnesses who have agreed to come before the Subcommittee. Let me yield now to Senator Nunn.

OPENING STATEMENT OF SENATOR NUNN

Senator NUNN. Thank you very much, Chairman Stevens.

Today we begin a series of hearings to examine the global proliferation of weapons of mass destruction. As we stand at the threshold of the 21st century, there is perhaps no greater threat to this Nation and, indeed, to the world's national security than the illicit spread of these awesome and awful devices.

The end of the Cold War and the collapse of Soviet Communism eliminated what many considered to be the gravest threat to our world stability and security, that is, the threat of an all-out confrontation and even war between the two superpowers. We have moved from an era of high risk but also high stability to a climate of much lower risk but also much less stability. In many ways, the world is a far more unstable place today than it was a decade ago. Ethnic, religious, racial, and political conflicts have led to an increasing level of violence and terrorism around the globe. It seems no place is immune today—not the marketplaces of Sarajevo, not the buses of Tel Aviv, not the subways of Paris, not the office buildings of New York or Oklahoma City. Zealotry in the name of a cause has created individuals and groups who are increasingly willing to do the unthinkable. Unfortunately, the ability to obtain weapons of mass destruction and carry out the unthinkable is increasingly coming within their grasp.

While the fall of the Soviet Union has certainly diminished the risk of a major war between the United States and a would-be challenger, it has also created new risks which could have a very severe impact on the United States. Never before has an empire collapsed leaving some 30,000 nuclear weapons, hundreds of tons of fissile material, at least 40,000 tons of chemical weapons, advanced biological weapons, huge stores of sophisticated conventional weapons, and literally thousands of scientists with the knowledge to make all of these very sophisticated weapons. As the remnants of that empire struggle to achieve democratic reforms and build a free-market economy, the challenge facing the Russians, and the entire world, is to ensure that the former Soviet Union does not become a vast supermarket for the most deadly instruments known to man. Unfortunately, there are already many prospective customers.

At the same time, the inexorable advance of science and communications has made the technology of these instruments available to an ever-widening audience. The ingredients for sarin and other chemical weapons are easily accessible today over the Internet, as is information about biological weapons and even instructions as to how to make a nuclear device. The scenario of a terrorist group either obtaining or manufacturing and using a weapon of mass destruction is no longer the stuff of science fiction or even adventure movies. It is a reality which has come to pass and one which, if we do not take appropriate measures, will increasingly threaten us in the future.

Indeed, it is just that reality which has led to today's hearing. In an event that was little noticed at the time outside of Japan, 7 people died and over 500 were treated at hospitals when a mysterious vapor seeped into the open windows of an apartment complex in the city of Matsumoto on June 27, 1994. While some experts ultimately concluded that the vapor was the deadly nerve gas sarin, no group ever claimed credit for the incident and no arrests were made. As a result, the world paid little attention to the Matsumoto City incident.

The world was forced to pay attention, however, on the morning of March 20, 1995. On that day, at the height of the morning rush hour, several members of a religious cult which preached Armageddon between the United States and Japan unleashed a sarin gas attack on the innocent civilian riders of the Tokyo subway system. The attack specifically targeted a central station in the heart of the city which served the major government agencies of the Japanese Government.

Twelve persons were killed and over 5,000 were injured. If the cult had crafted a more efficient delivery system prior to their attack, the death toll could have easily soared into the tens of thousands. Nevertheless, the relatively low death toll from this attack is a credit to the excellent work of the Japanese emergency response and health authorities. As a result of the investigation which followed the Tokyo attack, Japanese authorities were able to develop evidence that this cult had also carried out the earlier attack which I alluded to in Matsumoto City.

The cult, known as the Aum Shinrikyo, thus gained the distinction of becoming the first group, other than a nation during wartime, to use chemical weapons on a major scale. I believe this attack signals the world has entered into a new era. Because of these concerns, I directed the Subcommittee minority staff to examine the activities of the Aum and to report back to the Subcommittee and to the Senate on the lessons to be learned from this group. Their report is deeply disturbing.

For example, this was a group which, in furtherance of its religious and political goals, sought to acquire and planned to use some of the deadliest weapons known to man.

The Aum had built its own chemical manufacturing plant in which it produced such chemical agents as sarin and VX gas. They had also built a plant to develop biological weapons and may have developed such agents as botulin toxin and anthrax.

With over $1 billion in assets, money was no object for this group. They were willing to spend hundreds of thousands of dollars at a time on pieces of equipment to aid in their weaponization program. They were even willing to consider the cost of buying a nuclear weapon.

The Aum's reach stretched literally around the world as they sought to fulfill the prophecies of their leader. The Aum had made extensive contacts in Russia in an effort to obtain military training, equipment, and weapons, including laser weapons and even nuclear weapons. They had traveled to Australia to mine uranium and to carry out tests with chemical agents. They even had members working here in the United States attempting to obtain advanced technology and equipment to help them carry out weapons production.

As we will hear today, the Aum's office in the United States was accessing and attempting to purchase sophisticated computer programs and equipment with potential military applications.

Despite all this activity, and despite the fact that the group's doomsday philosophy was primarily against the United States, the Aum was virtually unknown to U.S. intelligence or law enforcement prior to the March 20 subway attack. In an age when we have witnessed two major terrorist attacks on targets in the United States, anything other than constant vigilance in this area could have catastrophic consequences. Yet preventing groups such as the Aum from arising in the future and obtaining similar destructive capabilities is an extremely complex problem. It is not one that will be solved in 1 or 2 years. It is not one that will yield to simple solutions. It is a problem which will have to be fought on many fronts:

We must develop a real awareness of the proliferation threat among the public and, in particular, among the business and scientific communities which are the source of much of the precursor technology and materials which are vital to these groups.

We must also beef up our human intelligence, and that means we must develop better coordination between intelligence and law enforcement, not only in this country but also around the world.

We must develop a global strategy, one which includes the countries of the former Soviet Union and, in particular, Russia to improve our capabilities worldwide to track and trace nuclear, chemical, and biological material. This means we must concentrate on research and development efforts to greatly improve our capabilities to detail, trace, and track weapons of mass destruction.

We must enhance export control regimes worldwide and develop better technologies for better border control.

We must also make maximum use of arms control agreements such as START II and of international treaties and conventions such as the Non-Proliferation Treaty, the Biological Weapons Convention, and the Chemical Weapons Convention. And that gets right here at home in the Senate.

We must have a global coordinated effort against international organized crime and terrorism.

We must intensify our cooperative efforts with the countries of the former Soviet Union to help them destroy their excess weapons and materials, improve their accounting and storage for those they do maintain, and constructive economic alternatives for their scientists who will otherwise inevitably be tempted to sell their knowledge to Libya, North Korea, or groups around the world such as the Aum.

On this last point, we will hear tomorrow from a number of experts who will discuss the controls on chemical and biological weapons in the former Soviet Union, including a former Soviet chemical weapons scientist who will express his concerns on this issue.

It is my hope that the Subcommittee's hearings today and tomorrow, Mr. Chairman, will help to focus attention on these issues. The activities of the Aum should serve as a warning to us all. This is a lesson we will ignore at our own peril.

Before I conclude, I would like to thank the Government of Japan for the assistance they have provided to the Subcommittee in connection with this investigation. On relatively short notice they arranged for the Subcommittee staff to travel to Tokyo and provided them with a series of highly informative briefings from a number of key agencies and ministries. They have been candid and forthcoming in their discussions with our Subcommittee, and they have been very gracious in responding to the Subcommittee's requests. The United States and Japan have forged a valuable partnership over the years, and the cooperation the Japanese Government has exhibited in this matter proves the worth of that partnership again.

I would like to note the assistance of the Australian Government in this matter as well. They, too, have been gracious in providing the Subcommittee with important information and documents which were an invaluable aid to this investigation. I would also acknowledge the assistance of Russian authorities in this matter.

I would also, Mr. Chairman, thank you and thank Senator Roth and the entire majority staff for their cooperation and support in connection with this hearing. Last, but certainly not least, I would like to join you, Mr. Chairman, in welcoming our good friend, Senator Dick Lugar, who has worked diligently on these issues with me and with others over the years, and certainly he is an expert in this area and has taken the lead on many of these areas legislatively. Senator Lugar, we are delighted to have you.

Senator Cohen, it is good to be with you, as usual, in your diligent work on this Subcommittee, so I look forward, Mr. Chairman, to hearing from the staff and from our witnesses this morning.

Senator STEVENS. Senator Cohen, do you have an opening statement?

OPENING STATEMENT OF SENATOR COHEN

Senator COHEN. I do, Mr. Chairman. I will try and make it as brief as possible.

For years, the threat of terrorists acquiring and using nuclear, biological, chemical or other weapons of mass destruction has been the realm of fiction, speculated upon by authors ranging from Larry Collins to Stephen King (as well as a less well-known author from Bangor, Maine).

In March, however, the world was shocked by the news that a hitherto unknown religious cult in Japan had unleashed a nerve gas attack in the Tokyo subway system. As one of our witnesses will tell us this morning, we would not have been shocked had we been paying attention, for this same cult had staged an even more sophisticated—although, fortunately, less deadly—nerve gas attack last year in Japan.

What really is shocking is that this cult had established a global network of individuals engaged in the acquisition of advanced technology, the acquisition of weapons, the testing of weapons, the raising of funds, and possibly the planning of attacks outside Japan—this and the fact that this network operated beneath the gaze of the U.S. intelligence and under the nose of Japanese law enforcement.

With the leader of the Aum now in the dock in Tokyo, some might be inclined to view the case as a bizarre bit of history or at most, as one Japanese publication put it: Japan's answer to the O.J. trial. But the past is prelude, and having ignored the implications of the 1994 gas attack in Japan, we will have only ourselves to blame if we are caught off guard next time.

Countries that we know to be sponsors of international terrorism, such as Iraq, Iran, Libya, and Syria, have devoted considerable resources to developing and producing biological and chemical weapons. It does not require much imagination to envision that those who hire terrorists to blow up jumbo jets might also enlist them to poison our population.

And, as the Aum case demonstrates, even small but dedicated groups can develop the means to unleash death on an unsuspecting society. As the witnesses today will testify, the Aum not only developed the ability to produce and deliver chemical weapons, it also had begun taking steps to develop biological weapons and had nuclear ambitions, as well.

Our witnesses will also testify to the fact that there are no easy solutions. The very nature of our free and open society makes us America, the vulnerable.

To cite one example, the Senate's consideration of the Anti-Terrorism Bill last spring highlighted the delicate balance that must be struck in a free society between protecting our civil liberties and protecting our citizens lives. While some point to the Branch Davidian case as an example of excessive use of force by the state, our witnesses today will testify that the Aum case demonstrates excessiveness at the other end of the spectrum. The unfettered freedom given religious groups by the Japanese Government apparently contributed directly to thousands of innocent casualties that resulted from the Aum's nerve gas attacks last year and this spring.

While the Japanese and American legal and social contexts are very different, the Aum case holds lessons for us as we continue the always ongoing quest for how best to "insure the domestic tranquillity" and "secure the blessings of liberty."

One lesson is that if prevention fails, then proper preparation can minimize the consequences of an attack. I believe that during the coming 2 days of hearings, one message we will hear repeatedly is that the United States can be much better prepared than we currently are and that much of what needs to be done involves not billions for new technology but better coordination among Federal agencies and between Federal and local officials.

During consideration of the Anti-Terrorism Bill, the Senate adopted an amendment drafted by Senator Nunn and others regarding use of the Armed Forces to respond to chemical weapons and biological weapons attacks.

Attached to it was an amendment I drafted requiring the Executive Branch to improve the coordination among the many Federal agencies that have a role in countering the chemical weapons and biological weapons threat. It also required improvements in civilian agencies' capabilities so that they do not become totally and permanently reliant on the military.

The military has a contribution to make in addressing these threats, but it should play a supporting role and not the leading role in domestic law enforcement activities.

I hope the coming 2 days will give us an opportunity to explore these and other issues related to this critical issue.

Senator Nunn, I commend you for launching, back when you were chairman, these investigations into the threat posed by weapons of mass destruction. I look forward to working with you and other Members of the Senate to define measures to better protect the American people from this threat, based in part on the testimony we will receive today and tomorrow.

Senator STEVENS. Senator Glenn?

OPENING STATEMENT OF SENATOR GLENN

Senator GLENN. Thank you. Just briefly, Mr. Chairman, I, too, want to compliment you and all those who have been involved with having this hearing. Over 6 years ago, the Senate Committee on Governmental Affairs and the Permanent Subcommittee on Investigations (PSI), jointly held a series of hearings that were called "Global Spread of Chemical and Biological Weapons." Out of that came a 746-page print that I believe still remains one of the best available references for those who are interested in doing background work in this area, one of the best reference works that we have in leading up to the current consideration of these areas.

I think this is much more likely to be a problem for us and other nations around the world by far than ICBM concerns, because this is so much easier to do.

In those hearings, just to demonstrate this very briefly, back in those days when we had the other hearings we had the testimony of David Goldberg who was a chemical weapons analyst, Department of the Army, and I asked him at that hearing about how common the knowledge was about how to produce these things. And he said you can go to any first-year organic chemistry book and at least get the basic chemistry for the production of some of these agents. It is very easy. And Judge Webster, who was the head of CIA at that time, I asked him about what size area would be needed to set up a plant to produce this, and I asked him compared with this room or a factory or a warehouse and whatever, and Judge Webster's testimony was, when he referred to this room, he said this is large enough to produce a small factory, and that is probably about as far as I should go in being specific about it. But the process is not that involved. That was Judge Webster.

So you could set up a factory, a small factory, in a place the size of this room. So it is no wonder we have trouble keeping up with where these things are all over the world, so I think it is one of our toughest problems. I am glad to see us following through on this, and I think we need a lot more attention on this thing.

I don't know that we can solve this problem. It is so easy to transport this stuff. It is not like ICBMs. You can take this stuff and go through detectors at airports and all sorts of things. And yet biological weapons are as vulnerable—I mean, they are as destructive as nuclear weapons except they just take a little bit more time as they produce their toxins and so on. It takes a little more time, but with a small cache of these things, you can kill as many people as a nuclear weapon would kill in just a few seconds. So it is one of our biggest problems.

I think our first thing to do is to get the chemical weapons convention taken care of. I would like to see that get approved. At least that puts the stamp of disapproval of most of the industrialized world on these things so we then can work forward from that. Thank you, Mr. Chairman.

Senator STEVENS. Senator Lugar, do you have a comment this morning?

OPENING STATEMENT OF SENATOR LUGAR

Senator LUGAR. Yes, I do, Mr. Chairman. I thank you for your welcome, and Senator Roth and Senator Nunn for their invitation to join the Committee and to work jointly with the European Affairs Subcommittee of the Foreign Relations Committee on these problems.

Conventional wisdom holds that, of many extraordinary changes in the world since the fall of the Berlin Wall, the one that is likely to have the most profound consequences for American national security involves the expiration of Communism, and, with it, the expansion of the Soviet adversary. However, assessed in terms of direct consequences for American security, the disappearance of Soviet Communism is rivaled and perhaps exceeded, in my view, by the collapse of the totalitarian command and control society, especially the command and control of the superpower arsenal of weapons of mass destruction and weapons-usable materials.

As a consequence of the collapse of this command and control society, the vast potential supermarket of nuclear, chemical, and biological weapons and weapons-usable materials is becoming increasingly accessible. Absent a determined program of action that is as focused, serious, and vigorous as America's Cold War strategy, it is my view that Americans have every reason to anticipate acts of nuclear, chemical, or biological terrorism against American targets before this decade is out.

The single most important truth about the security environment in which we now live is that Russia is convulsed by a genuine ongoing revolutionary transformation of the state, the economy, the military, and the society. But unlike prior revolutions, history has chosen to store in the midst of this current Russian revolution a superpower arsenal of nuclear, chemical, and biological weapons and materials.

For seven decades, the bad news was that a totalitarian Communist government imprisoned its entire society. But one of the few benign results of that totalitarian system was unquestioned control of dangerous weapons-usable materials, including weapons of mass destruction. With the disappearance of the Soviet Union and the death of Communism, powerful forces are now tearing apart the fabric of command and control in that economy, government, and state. Among these forces, the most powerful is the deepest yearning for individual freedom which, under conditions of disintegrating authority, is often indistinguishable from license and anarchy which help to breed conditions of lawlessness in which nothing can be secure from loss, theft, or sale.

The human beings and systems designed by a totalitarian state to manage the Soviet Union's arsenal of weapons of mass destruction are not unaffected by these developments. Over the past 3 or 4 years, trickles of weapons-usable materials have begun showing up in the West. The current trickle forewarns of an impending flow of nuclear, chemical, and biological weapons materials and perhaps even of weapons themselves.

With the loosening of controls over the safety and security of weapons-grade material that has accompanied this disintegration of the Soviet Union, the question arises: Has the likelihood of a weapon of mass destruction exploding in U.S. territory gone up or down? It is my view the risk has increased.

While the probability of large-scale nuclear, chemical, or biological exchange has mercifully decreased, the probability that one, two, or a dozen weapons of mass destruction detonating in Russia, or Europe, or the Middle East, or even the United States, has increased. Because this threat comes in a form so unfamiliar, indeed so radically different from prior experience, and because the instruments and policy to address it are so unlike the "business" that the White House and the national security establishment have pursued for decades, the American political leadership, the Congress, and the American people have great difficulty awakening to this fact.

These are precisely the kinds of challenges that my colleague, Sam Nunn, has been willing to address during his tenure in the Senate, and I have been pleased to join with him in tackling such issues during the past few years.

On August 22 and 23, Senator Nunn and I initiated this series of hearings. Those initial hearings were held under the auspices of the European Subcommittee of the Foreign Relations Committee. We called the hearings to sound a wake-up call about this most direct threat to U.S. national security interests to date and for the foreseeable future. The defining danger of proliferation of weapons of mass destruction is not so much Iran's purchase of civilian nuclear reactors from Russia that may assist Iranian nuclear ambitions a decade hence. Rather, it is the threat today and tomorrow that Iran and other aspiring proliferants will purchase weapons of mass destruction or weapons-usable material from some fragment of the Russian custodial system.

The second purpose of those hearings was to begin to define in some detail the shape of this new and barely recognizable threat.

American policy has long recognized the risk posed by additional states acquiring weapons of mass destruction, but traditional nonproliferation is not the leading edge of the problem. Nor is the main problem one of accelerating "denuclearization" and reduction of chemical and biological weapons by the dismantling of ready weapons, although this is vitually important. Rather, today the defining danger is that of the loss of control of tens or hundreds of pounds of weapons-usable materials, such as uranium, plutonium, and sarin, or, indeed, of numbers of actual weapons themselves.

Although we were treated during the August hearings to some graphic descriptions of lax security at Russian nuclear facilities, the security at Russian nuclear facilities is considered generally better than the security at Russian chemical weapons storage sites. Indeed, many Russian scientists believe that Russia's chemical arsenal presents a far more exposed and appealing target for potential thieves and terrorists than the nuclear sites.

The third purpose of the initial hearings was to begin to outline a strategy and an agenda for action that would galvanize the President and the American people to adopt policy priorities and the requisite resources commensurate with the vital national interests the U.S. has in the fate of the former Soviet arsenal. To date, the United States response to this threat has not even begun to approximate the U.S. stakes in the matter.

Although there are a vast number of small U.S. programs which Senator Nunn and I have sponsored, and which the Senators here today have supported, that are designed to deal with many different weapons issues in the former Soviet Union, these programs cumulatively address only at the margins the need to reduce the near-term leakage threat of materials and weapons. A new level of commitment, effort, and resources is required if the United States is to guard itself against this new threat.

Difficult as it is, identifying a new challenge is the easier part of the problem. Summoning the political leadership, the political will and resources, and the support of the American people is harder still. Despite the threat of loose weapons of mass destruction and weapons-usable materials, will the political leadership of the country, including the Congress, step up to the plate? Do any new initiatives, however vital to the national interests of the United States, have much prospect of getting a serious hearing in the climate of massive deficits, deep budget cuts, and shrinking leadership and imagination?

Why is the Senate not debating the chemical weapons convention now, negotiated by the Bush administration, submitted by the Clinton administration, to determine how this multilateral vehicle can assist the United States in meeting the kind of threat and terror visited on Tokyo's subway system?

Or will this new threat be given the priority it deserves only on the morning after the first act of nuclear, chemical, or biological terrorism takes place on American soil? What will we wish we had done? What will the administration do then? What will the Congress and the American people demand then?

These hearings today and tomorrow are designed to force us to pause, reflect, prioritize, and summon political leadership and the support of the American people to address this new security threat to our country. I am pleased to have an opportunity once again to work with my colleague, Sam Nunn, and his colleagues on this Subcommittee, and I commend them and the Permanent Investigations Subcommittee for continuing this probe into a new and present danger to the United States.

I thank you, Mr. Chairman.

[The media release from Senator Lugar follows:]

PREPARED STATEMENT OF SENATOR LUGAR

LUGAR WARNS OF PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

SENATOR CALLS WEAPONS PROLIFERATION "GREATEST THREAT TO OUR NATIONAL SECURITY"

WASHINGTON—U.S. Sen. Richard Lugar today issued the following statement at hearings of the Senate Permanent Subcommittee on Investigations on "Global Proliferation of Weapons of Mass Destruction:"

"Conventional wisdom holds that of the many extraordinary changes in the world since the fall of the Berlin Wall, the one that is likely to have the most profound consequences for American national security involves the expiration of Communism and, with it, the expansionist Soviet adversary that served as the fixed point for U.S. security policy.

"However, *assessed in terms of direct consequences for American national security, the disappearance of Soviet communism is rivaled and perhaps exceeded, in my view, by the collapse of the Soviet totalitarian command and control society, especially the command and control of the superpower arsenal of weapons of mass destruction and weapons-usable materials.* As a consequence of the collapse of this command and control society, a vast potential supermarket of nuclear, chemical, and biological weapons and weapons-usable materials is becoming increasingly accessible.

"Absent a determined program of action that is as focused, serious, and vigorous as America's Cold War strategy, it is my view that Americans have every reason to anticipate acts of nuclear, chemical, or biological terrorism against American targets before this decade is out.

"The single most important truth about the security environment in which we now live is that Russia is convulsed by a genuine, ongoing revolutionary transformation of the state, the economy, the military and the society. But unlike prior revolutions, history has chosen to store in the midst of this current Russian revolution a superpower arsenal of nuclear, chemical, and biological weapons and materials.

"For seven decades, the bad news was that a totalitarian Communist government imprisoned its entire society. But one of the few benign results of that totalitarian system was unquestioned control of dangerous weapons-usable materials, including weapons of mass destruction. *With the disappearance of the Soviet Union and the death of communism, powerful forces are now tearing apart the fabric of command and control in the economy, the government, and the state.* Among these forces, the most powerful is the deepest yearning for individual freedom which, under conditions of disintegrating authority, is often indistinguishable from license and anarchy which helps to breed conditions of lawlessness in which nothing can be secure from loss, theft, or sale.

"The human beings and systems designed by a totalitarian state to manage the Soviet Union's arsenals of weapons of mass destruction are not unaffected by these developments. *Over the past three or four years, trickles of weapons-usable materials have begun showing up in the West. The current trickle forewarns of an impending flow of nuclear, chemical, and biological-weapons materials and perhaps even of weapons themselves.*

"With the loosening of controls over the safety and security of weapons-grade materials that has accompanied the disintegration of the Soviet Union, the question arises: *Has the likelihood of a weapon of mass destruction exploding on U.S. territory gone up or down? It is my view that such a risk has increased.* While the probability of a large-scale nuclear, chemical, or biological exchange has mercifully decreased, the probability that one, or two, or a dozen weapons of mass destruction detonating in Russia, or Europe, or the Middle East, or even the United States has increased.

"However, because this new threat comes in a form so unfamiliar, indeed so radically different from prior experience, and because the instruments and policies to address it are so unlike the 'business' that our White House and national security establishments have pursued for decades, the American political leadership, the Congress and the American people have great difficulty in awakening to this fact. But these are precisely the kinds of challenges that my colleague, Sam Nunn, has been willing to address during his tenure in the Senate, and I have been pleased to join with him in tackling such issues over the past few years.

"On August 22 and 23, Senator Nunn and I initiated this series of hearings. Those initial hearings were held under the auspices of the European Subcommittee of the Foreign Relations Committee. *We called those hearings to sound a wake-up call about this most direct threat to U.S. interests today and for the foreseeable future.* The defining danger of proliferation of weapons of mass destruction is not so much Iran's purchase of civilian nuclear reactors from Russia that may assist Iranian nuclear ambitions a decade hence. Rather, it is the threat today and tomorrow that Iran and other aspiring proliferants will purchase weapons of mass destruction or weapons-usable materials from some fragment of the Russian custodial system.

"The second purpose of those hearings was to begin to define in some detail the shape of this new and barely recognizable threat. American policy has long recognized the risks posed by additional states acquiring weapons of mass destruction, but traditional non-proliferation is not the leading edge of this problem. Nor is the main problem one of accelerating 'denuclearization' and reducing the threat of chemical and biological weapons by dismantling thousands of ready weapons, although this is vitally important. Rather today, the defining danger of weapons of mass destruction is that of the loss of control of tens, or hundreds of pounds of weapons-usable materials such as uranium, plutonium, and sarin, or indeed, of numbers of actual weapons themselves. Although we were treated during the August hearings to some graphic descriptions of lax security at Russian nuclear facilities, security at nuclear facilities is considered generally better than the security at Russian chemical weapons storage sites. Indeed, many Russian scientists believe that Russia's chemical arsenal presents a far more exposed and appealing target for potential thieves or attackers than the nuclear sites.

"The third purpose of those initial hearings was to begin to outline a strategy and agenda for action that will galvanize the President and the American people to adopt the policy priorities and the requisite resources commensurate with the vital national interests the U.S. has in the fate of the former Soviet arsenal. *To date, the U.S.'s response to this new threat of nuclear, chemical and biological leakage has not even begun to approximate U.S. stakes in the matter.* Although there are a vast number of small U.S. programs that Senator Nunn and I have sponsored that are designed to deal with many different weapons issues in the former Soviet Union, these programs cumulatively address only at the margins the need to reduce the near-term leakage threat of materials and weapons of mass destruction to the United States. A new level of commitment, effort, and resources is required if the United States is to guard itself against this new threat.

"Difficult as it is, identifying a new challenge is the easier part of the problem. Summoning the political leadership, the political will and resources, and the support of the American people to act is harder still. Despite the threat of loose weapons of mass destruction and weapons-usable materials, will the political leadership of this country, including this Congress, step up to the plate? Do any new initiatives, however vital to the national interests of the United States, have much prospect of getting a serious hearing in the climate of massive deficits, deep budget cuts, and shrinking leadership and imagination? Why is the Senate not debating the Chemical Weapons Convention—negotiated by the Bush Administration and submitted by the Clinton Administration—to determine how this multilateral vehicle can assist the U.S. in meeting the kind of threat and terror visited on Tokyo's subway system?

"Or will this new threat be given the priority it deserves only on the morning after the first act of nuclear, chemical, or biological terrorism takes place on American soil? What will we wish we had done? What will the Administration do then? What will the Congress and the American people demand then?

"These hearings today and tomorrow are designed to force us to pause, reflect, prioritize, and to summon political leadership and the support of the American people now to address this new security threat to our country.

"I am so pleased to have the opportunity once again to work with my friend and partner, Sam Nunn, and to commend him and the Permanent Investigations Subcommittee for continuing to probe into this new and present danger to the United States."

Senator STEVENS. I am the new Chairman here, and under the circumstances that this investigation has been conducted primarily by the minority staff under the direction of Senator Nunn, I believe it is only proper that he should Chair these hearings. So I turn the Chair over to him.

Senator NUNN [presiding]. Mr. Chairman, thank you very much. We, as you know, swear in all the witnesses before our Subcommittee, so I will ask both of our witnesses, John Sopko, who is the Deputy Chief Counsel, and staff counsel, Alan Edelman—and I believe Rick Kennan is not going to testify, but our two witnesses, John and Alan, will testify, so I would ask both of you to hold up your right hand and take the oath. Do you swear the testimony you will give before the Subcommittee will be the truth, the whole truth, and nothing but the truth, so help you God?

Mr. SOPKO. I do.

Mr. EDELMAN. I do.

Senator NUNN. Thank you. I would ask you to go ahead and proceed with your statements, and I understand, Rick, you are not going to be testifying this morning. Right?

Mr. KENNAN. That is correct.

Senator NUNN. We thank you for your help. John?

TESTIMONY OF JOHN F. SOPKO, DEPUTY CHIEF COUNSEL TO THE MINORITY, ACCOMPANIED BY ALAN EDELMAN, COUNSEL TO THE MINORITY, PERMANENT SUBCOMMITTEE ON INVESTIGATIONS

Mr. SOPKO. Thank you. Mr. Chairman and Members of the Subcommittee, as you noted, this week the Subcommittee begins the first in a series of hearings concerning the global proliferation of weapons of mass destruction by looking at the case study of the Aum Shinrikyo's activities in Japan and elsewhere.

As noted by Senator Glenn, 6 years ago in 1989, this Subcommittee, in conjunction with the Committee on Governmental Affairs, held 4 days of hearings on the spread of chemical and biological weapons. At those hearings, the specter of terrorist groups using chemical or biological weapons was only hypothetical. As we all know from recent events in the United States, the destructive intentions of fanatical groups and individuals has become an actuality in Oklahoma, New York City, and in Arizona. And, just 7 months ago, on March 20, we witnessed the first major use of chemical weapons by terrorists with the sarin gas attack in the Tokyo subway system.

Commentators throughout the world now agree that these events are of major international significance. The proverbial genie has been released from its bottle. In a quantum leap, terrorists responsible for the American and Japanese events have planted ideas and provided roadmaps for others to attack American domestic targets as well as to use such weapons against innocent civilian populations worldwide.

In the course of the last 5 months, the minority staff conducted hundreds of interviews of both government and private individuals. The staff received both classified and unclassified briefings from almost every major U.S. law enforcement and intelligence agency as well as many elements of our military and civilian agencies. The staff was also briefed by numerous foreign agencies, including officials of the Japanese, German, Russian, Ukrainian, and Australian governments. In addition, 2 months ago the staff traveled to Japan, Russia, Ukraine, and Germany to obtain firsthand information concerning the activities of the Aum cult.

The staff's investigation of the activities of the Aum Shinrikyo found evidence to suggest that the Aum cult was a clear danger to not only the Japanese Government but also to the security interests of the United States and that this danger, although lessened significantly by recent actions of the Japanese authorities, is still present.

Although the findings may initially sound farfetched and almost science fictional, the actions of the Aum and the facts corroborated from multiple sources by the staff create a terrifying picture of a deadly mixture of the religious zealotry of groups such as the Branch Davidians, the anti-government agenda of the U.S. militia movements, and the technical know-how of a Dr. Strangelove.

The staff found, for instance, that: The cult was extremely large with approximately 40,000 to 60,000 members; the cult was extremely wealthy with more than $1 billion in assets; the cult was actively recruiting scientists and technical experts in Japan, Russia, and elsewhere; that the cult was planning and apparently had the means to directly assault the leadership of the Government of Japan; that the cult had produced chemical weapons, including toxic agents such as sarin, VX, phosgene and sodium cyanide; that the cult was also in the process of developing biological weapons, including anthrax, botulism and "Q" fever; that the cult attempted to assassinate the chief law enforcement officer for Japan as well as the Governor of Tokyo; that the cult had successfully infiltrated various levels of Japanese Government and industry, including elements of Japan's law enforcement and military community; that the cult regularly used murder and kidnapping to silence its enemies in Japan; and that the cult acquired conventional armaments and attempted to acquire weapons of mass destruction and their technologies from the former Soviet Union.

The cult leadership was ruthless, cunning, and fully willing to utilize any and all means, including the killing of hundreds of thousands of innocent citizens, to carry out its avowed purpose of plunging both the United States and Japan into a war of Armageddon. As noted in the opening statements of various Senators, the cult, its activities, and intentions were not fully appreciated by U.S. law enforcement and intelligence services until after the Tokyo gassing incident on March 20, 1995.

In a large sense, the Aum incident is a remarkable yet frightening case study of the threat modern terrorism poses to all industrial nations. It serves as a harsh wake-up call for the United States which until recently was rather complacent about the threat of terrorism.

Much is still not known about all of their interests and activities, especially here in the United States and Russia. Most of the trials in Japan have just started. To the staff's knowledge, none of the defendants have been debriefed by U.S. officials. Despite this, much can be learned from what the staff was able to uncover in its short 5-month inquiry.

The following will be a brief summary of what we know about the Aum and its activities around the world.

In August of 1989, the Tokyo Metropolitan Government granted the Aum official religious corporation status, which was just taken away, we believe, yesterday by the Japanese authorities. This law provided the Aum various privileges including massive tax breaks and de facto immunity from official oversight and prosecution. The staff was repeatedly told, especially on its Japanese trip, that this was a significant event in the development of the Aum's deadly activities. Although the police could investigate a religious group for criminal acts, the staff was told by Japanese cult experts and government officials that in practice this would be difficult if not impossible to do because of the law and the government's reluctance to do such investigations.

With its registration as a legally recognized religion, the Aum's activities and character dramatically changed. Its net worth grew from less than 430 million yen, approximately $4.3 million, when recognized in 1989 to more than 100 billion yen, or approximately $1 billion, by the time of this year's Tokyo incident. Likewise, the membership rose dramatically after legalization. From merely a score of members in 1984, it grew by its own account to 10,000 members in 1992 and over 50,000 worldwide in 1995. From one office in Japan in 1984, it expanded to over 30 branches in over 6 countries. We have prepared a chart, which shows some of the worldwide activities and locations of the Aum sect.[1]

The staff learned that starting in 1989 the cult also became more aggressive and dangerous. With its dramatic growth, the staff found evidence of increased complaints from parents and family members of Aum recruits alleging kidnappings and other physical assaults.

Another event that the staff learned was important in the changing character of the Aum cult concerned their brief foray into politics. The year after they became a registered religion, Asahara announced to his members that the Aum was to run a slate of candidates in the Japanese Diet in February of 1990. Asahara and 24 members of the inner circle ran for the parliament and all lost.

The 1990 election defeat was the final turning point for the direction the Aum would eventually take. After their defeat, the Aum gave up all legal pretensions and turned away from normal interaction with the larger Japanese society. From then on, the rhetoric of Armageddon and paranoia became incessant. Cult experts in Japan told the staff that in hindsight it appears that from 1990 onward, the die apparently was cast for a violent confrontation with the people of Japan.

It was a core element of the Aum religion that salvation would only come at the end of Armageddon to those who adopted the Aum faith. The Aum foretold salvation for those Aum members who attained a higher state through the teachings of Asahara, the Supreme Master. Asahara also preached salvation even to those members who perished in the predicted Armageddon since they were assured a special status in their reincarnated state.

In 1989, Asahara published a major religious treatise on Armageddon called "The Destruction of the World." In it, Asahara apparently described a worldwide calamity based upon a war between Japan and the United States that would start sometime in 1997.

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[1] See Appendix F of Staff Statement.

In 1993, Asahara again publicly reiterated his predictions of Armageddon. In a book entitled "Shivering Predictions by Shoko Asahara," he stated that, "From now until the year 2000, a series of violent phenomena filled with fear that are too difficult to describe will occur. Japan will turn into waste land as a result of a nuclear weapons' attack. This will occur from 1996 through January 1998. An alliance centering on the United States will attack Japan. In large cities in Japan, only one-tenth of the population will be able to survive."

He later wrote that, "A Third World War will break out. I stake my religious future on this prediction. I am sure it will occur."

Although most of Asahara's prophecies predicted this Armageddon in 1997 or 1998, documents recently seized by Japanese authorities from Aum facilities indicate that sometime starting in 1994 the date for this cataclysmic event was moved up specifically to November of 1995. The staff was told by Japanese Government sources that they were concerned from their analysis of the cult teachings that the Aum may have "decided to speed things up" by instigating the predicted war between Japan and the United States in November of 1995.

This November prediction is especially troubling as it coincides with the planned visit of President Clinton and 17 other world leaders who are scheduled to gather in Osaka, Japan, for the annual Asia-Pacific Economic Cooperation meeting. It is scheduled now for November 16–19. The staff has not discovered any credible link between these two events. We have no credible evidence that the Aum planned an attack directly at the APEC gathering. However, the timing of the two events raises some concern.

It is a vexing task to quantify the level of threat a group such as the Aum presents to United States security. As this report indicates, the Aum was highly dangerous and extensively erratic and unpredictable, obtaining much of their direction from the "prophecies" and ramblings of a charismatic madman. However, it is clear that a core belief of the Aum was that the United States was their enemy and that a war with the United States was a central component of their prediction of Armageddon. Although no specific threat against President Clinton has been documented, the staff has learned that both the United States Secret Service and the Japanese Government take such a threat seriously and have taken security precautions.

In the course of our inquiry, it also became clear that the Aum included among the followers many highly trained graduates in the sciences and technological fields from some of Japan's leading universities. They included members with degrees in fields such as medicine, biochemistry, architecture, biology, and genetic engineering. A distinctive feature of this cult was that many were young intellectuals in their 20's and 30's who had dropped out of Japanese society.

Among some of Japan's best and brightest who joined the cult included a former researcher of the Japanese National Space Development Agency, an expert on chemical weapons who majored in organic physics at Tsukuba University, a researcher who studied elementary particles, a reporter with a major Japanese newspaper, a physicist from Osaka University, a cardiac specialist, and an organic chemist, to name a few. In the longer version of the staff statement, which is over 100 pages, we detail some of the members and the actual description of their backgrounds.

Senator NUNN. Without objection, your entire statement will be put in the record, and I understand it has been given out. Is that correct, the complete statement?

Mr. SOPKO. That is my understanding, Senator.

The staff also confirmed that they recruited from the military, the police, and certain key technological industries and faculties to further their militarization and intelligence functions.

For example, the staff learned that the Aum had a strategy to recruit officers of the Japanese Self Defense Force and to use them as "combat troops" for the cult as well as to assist them in training other Aum members and in providing intelligence on Japanese Government activities.

The Aum obtained the list of hundreds of Japanese Defense Force members and tried to recruit them. The list was recovered during the arrest of an Aum follower. This strategy placed a high priority on recruiting members of the First Airborne Brigade and other highly trained divisions of the Japanese military. The staff discovered evidence that to carry out this recruitment drive, the Aum even wiretapped the house of the First Airborne Brigade's commander to spy on his private life.

Some of these Japanese Defense Force recruits individually or in cooperation with other Aum members: Assisted in the burglary of the Metropolitan Police Department office to steal driver's license data; assisted in the break-in of the Hiroshima factory of Mitsubishi Heavy Industries in an attempt to steal technical documents on weapons such as tanks and artillery; assisted in a firebombing attack on the Aum headquarters in Tokyo in an attempt to inspire public sympathy for the Aum; and provided military training to other Aum members.

These Japanese Defense Force members also passed secret information to the Aum concerning the Metropolitan Police's planned raid on the Aum facilities. This raid was supposed to occur on March 20, 1995, but was postponed because of the Tokyo subway gassing that occurred on that date. The staff learned that these officers alerted the Aum of the anticipated raid, and as a result the Aum initiated their deadly subway assault to try to thwart that raid.

Unlike other religions, the Aum was organized into ministries and departments that attempted to mirror the Japanese Government. The staff has prepared a chart, which will be made an exhibit, that identifies all of the most important ministries. Some of the members of the inner circle who were heads of these ministries included Hideo Murai, the former Minister of Science and Technology. His was a key ministry which reportedly had over 300 members including a number of skilled scientists. Murai himself was assassinated after the Tokyo event, apparently by Japanese organized crime figures.

We have also listed Kiyohide Hayakawa, age 45, who was the Minister of Construction. He was one of Asahara's chief advisors and considered the mastermind of the sect's growth and militarization. He supervised the operations in the United States, Russia, and Australia, among other things.

Yoshihiro Inoue, age 25, the Intelligence Minister, was responsible for gathering intelligence on government counter measures. He was implicated in the major burglaries of the defense contractors as well as the infiltration of the Japanese Defense Forces. He has also been implicated in the letter bomb attack on Tokyo Governor Aoshima.

We have also listed Tomomitsu Niimi, 31, who is the Minister of Home Affairs for the Aum. This ministry was responsible for maintaining control and discipline over the membership. It was involved in most of the kidnappings and torture of dissident and runaway members.

Also listed is Ikuo Hayashi, 48, the Treatment Minister. He was a key player in developing the sarin for the Tokyo attacks.

Also listed is Seiichi Endo, age 34, the Health and Welfare Minister. Mr. Endo and his ministry were responsible for the chemical and biological weapons research and development. Endo has apparently confessed to his involvement in the sarin attacks and that Asahara had closely directed his research and development.

As I previously mentioned, the Aum was very wealthy. Japanese Government estimates place its assets at over 100 billion yen, or approximately $1 billion. They also list 16 separate pieces of property in 11 different prefectures belonging to the Aum. They also note that the cult possessed a large amount of liquid assets including a large helicopter, boats, gold bars, and cash.

The Aum amassed this fortune in a number of ways. Not only did they require their followers to turn over all of their earthly possessions, they also came up with a number of ingenious and outlandish money-making schemes from running noodle shops, operating a publishing house, and other legitimate businesses, all the way to extortion and selling their spiritual leader's blood and bath water.

We have before you, Senator, some of the various books that they published, actually very high quality publishing. They also published comic books, as well as other documents. Here are some Asahara tee shirts that they sold even after the Tokyo gas attack. It turned out that the successor to Asahara, who has been subsequently arrested, name Joyu, had become a teen idol to many youngsters in Japan, even after the Tokyo event. So you could go to their stores and buy this stuff, as well as cookies and other food products.

We have also prepared a chart here (appendix B) which we have sourced to the Japan Times, which is purportedly based upon documents that they had obtained listing some of the items that the Aum would sell. They ranged from headgear designed to synchronize one's brain waves to that of Asahara that would cost you approximately $10,000 a month, to a 200-cc bottle of water from Asahara's bath for $20. A significant amount was probably raised from these activities, although the exact total is not known.

As we mentioned, the Aum was also actively engaged in the preparation for both a conventional and unconventional attack upon the Japanese Government and its people. Much evidence of the Aum's militarization comes from former Aum members who have confessed to Japanese authorities. These confessions have been corroborated by weapons parts, equipment, and records seized by Japanese police, including the notebooks of Construction Minister Hayakawa and the computer files found at the sect's offices.

The Aum apparently had planned to illegally manufacture as many as 1,000 AK–47's and cartridges before the police raids. The staff learned that the Aum had been manufacturing parts for these guns with the aid of computer-controlled machine tools at the Aum's complex.

It also appears that the Aum was interested in developing laser weapons. The staff has learned from Japanese Government sources that notations found in Hayakawa's handwritten notebook indicate the cult was actively seeking information on the development of such weapons.

The cult also attempted to steal technology from NEC's laser beam laboratory in November of 1994. At the end of December 1994, Aum followers were arrested for burglarizing Mitsubishi Heavy Industries Research Center in Hiroshima. They apparently broke into that facility on a number of occasions in an effort to steal documents and data on laser beam technology.

The Aum's cult was also aggressively involved in chemical and biological weapons production. Although the extent of their success is not fully known to this date, the staff found evidence that they successfully produced nerve agents such as sarin, tabun, soman, and VX, and biological agents such as botulism and anthrax, and controlled substances such as LSD.

Just last week, on October 20, Japanese prosecutors revealed the full extent of Asahara's plot to use deadly sarin gas. At the initial arraignment against four cult members, the prosecutor publicly charged that the four, under the direction of Asahara, planned to produce 70 tons of sarin within 40 days of completion of the sarin production facility at Satyam No. 7. The prosecutors added that 20 kilograms of one batch was used in the June 1994 Matsumoto attack which killed 7 people.

It appears that starting in the spring of 1993, the Aum utilized its own chemical company to start acquiring the chemical agents and other materials necessary for full-scale production. Sarin research and production was conducted under the direction of Masami Tsuchiya, head of the cult's chemical team, and Seiichi Endo, the cult's Health and Welfare Minister. Production occurred at a facility in the Aum compound site in Kamikuishiki called Satyam No. 7. We have blown up photographs, aerial photographs taken of Satyam No. 7 and some of those buildings which we are showing right now.[1]

Reports from Japanese officials indicate that the sarin production facility was extremely sophisticated. It was almost all fabricated by the Aum members themselves who utilized their other companies as sources for material and technical expertise. According to prosecution sources, the cult produced 30 kilograms of sarin from their computerized chemical plant sometime in 1994 before an accident caused them to shut down operations. It is believed that the sarin for the June 27, 1994, Matsumoto incident was made at this facility before the accident.

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[1] See Exhibit No. 11.

We also have a chart showing the interior design of Satyam No. 7. We were told by almost every official we spoke to that it was a highly sophisticated chemical plant. (See appendix G.)

These are photographs, Senator, purportedly taken by a news reporter who snuck into the Satyam plant prior to the police closing it down, and he took a number of these photographs showing the interior of the building. We were denied access to the facility, so we could not corroborate whether these photographs accurately depict that facility.[1]

As previously noted, the Aum also tried to develop other chemical weapons such as soman, tabun, and VX. The staff confirmed from official documents that the Aum produced VX on at least four separate occasions, although full-scale production never occurred.

The staff confirmed from official documents that Mr. Niimi and others were involved in at least two VX attacks. They include the attack on a Mr. Hamaguchi with VX on December 12, 1994, while he was walking on an Osaka street. Hamaguchi died 10 days later on December 22. And if I can emphasize that although sarin is extremely deadly, as the witnesses in the next panel will discuss, VX is an even more deadly gas. And the fact that they were at least developing small quantities of VX is very significant for an understanding about how technically skilled and capable this group was.

The police detected a by-product of VX in Mr. Hamaguchi's blood serum confirming the presence of VX after his death. In another incident, Niimi attacked a Mr. Nagaoka, the head of the "Association of the Victims of Aum Shinrikyo" with VX gas in January of 1995. He fortunately survived but was in a coma for several weeks per a staff conversation we had with his son.

Ominously, there have been police reports cited in the Japanese press that sodium cyanide, linked to cult members, was found in late September 1995 in Japan. Police claim to have found as much as 8.5 kilograms of sodium cyanide in the apparent hideout of an Aum fugitive. The sources have said that this amount of sodium cyanide could kill approximately 70,000 people.

Materials seized at the Aum facilities and other evidence confirms that the Aum had embarked upon an intense research and development program for the production of biological weapons. Judging from this evidence, Japanese authorities believe the Aum succeeded in producing botulism toxin. The same Japanese authorities are less certain but have serious concern that the Aum had also produced anthrax bacillus. I will not describe both of those two agents, but the next panel will go into great detail about the lethality and medical consequences of both of those agents. Again, it goes to the importance of this cult as a case study because of their technical capabilities.

The staff has confirmed that Seiichi Endo, Health and Welfare Minister for the cult, confessed that he had been working on developing biological weapons and was close to finalizing this effort before the Tokyo incident. He claims to have embarked upon this work at the specific instructions of Asahara, the leader. Other Aum followers have also confessed to their involvement in the biological program.

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[1] See Exhibit No. 11c.

Probably the most chilling of all the reports coming out of Japan, Senators, were those that the Aum had actually attempted to use bacteria warfare.

The staff has learned that a number of devices were found by the police in Tokyo that authorities believe may have been intended to disperse anthrax. Three attache cases were discovered on March 15, 1995, 5 days before the Tokyo gas attack. We do not have a blown-up depiction of this chart, but this does appear as an appendix to the staff statement, and it shows the device as well as the containers. There were batteries in there and fans.

When the devices were found, none of the liquid was found. This later becomes important, as Mr. Edelman will tell you, because the Aum specifically was here in the United States purchasing large quantities of camcorder batteries, large quantities of serum bottles, and large quantities of small fans. We don't know specifically if this was used for bacterial dispersal or for chemical dispersal. We have had experts tell us it could have been utilized for either. Again, the witnesses in the next panel will discuss in some detail the significance of dispersal of either anthrax or chemical agents.

Mr. Chairman, in light of the length of this statement, I won't go into more detail about many of the other crimes and criminal activities committed by the cult. But, in the days following the subway attack, I think public scrutiny was on just the sarin attack by this cult. But, the staff has found upon closer scrutiny of the Aum's activities that there is a common character—excuse me, a common thread of criminality leading back to almost the date it was legally chartered. It includes murder, attempted murder, kidnapping, and burglaries. We have prepared a chart that shows their various criminal activities in Japan that we were able to corroborate. A more detailed description is found in the staff statement.

Senators, late in the evening of June 27, 1994, a substance later identified as sarin seeped through the open windows of apartments and houses in the Kaichi Heights neighborhood near the old heart of the city of Matsumoto. Seven people eventually died and over 500 were injured and taken to hospitals. It was not until the police arrests subsequent to the next year's Tokyo incident that uncontrovertible evidence was developed linking the Aum to Matsumoto. The staff has confirmed that Japanese police have confessions from a number of Aum followers implicating the Aum in this gas attack. The Science and Technology Minister for the Aum, Hideo Murai, as well as his successor, Masami Tsuchiya, have been implicated.

Tsuchiya, in a confession, has provided the police a motive for this sarin gas attack. The sarin was released within 30 feet of the dormitory where three judges were staying. These were three judges who were hearing a court case involving the Aum. Tsuchiya has told the police that he and his cohort proceeded to the parking lot next to the judges' dormitory and sprayed sarin out of a nozzle device attached to a truck specifically outfitted for that purpose. An electric heater was used to heat the liquid into a gaseous state for dispersal by an electrically powered fan. The gassing lasted for approximately 10 minutes, releasing a gas that was carried on a southeasterly wind into the targeted residence.

Matsumoto proved to them, the cult, that they could effectively deliver sarin. The police have recovered portions of the truck and the special fittings used in the Matsumoto attack.

Apparently the truck and its device were taken apart soon after the Matsumoto incident so it was not available to be used the following year in Tokyo. This would later have ramifications for the citizens of Tokyo. When it came time for the Aum to strike again, it has been surmised that they lacked their only tested delivery system. Its absence may have played a major role in the Aum's choice of the target and method of delivery, and that is the subways of Tokyo.

On the morning of March 20, 1995, the Aum attempted to murder tens of thousands of innocent people in order to create unimaginable disorder and chaos. Unlike the earlier Matsumoto incident in which the Aum targeted a specific group of people, the Tokyo subway attack involved the indiscriminate use of the chemical nerve agent sarin on an enormous civilian population. Had the chemical mixture and delivery system been slightly different, the resulting tragedy would have been unprecedented, if not beyond comprehension.

The Aum's plan was to place approximately 11 small containers of sarin on 5 trains running on 3 different lines of the Tokyo subway system. That subway system has over 5 million riders daily. The selected trains were scheduled to arrive at the central Kasumigaseki station within 4 minutes of each other at the height of morning rush hour, between 8:00 and 8:10 a.m. The containers, which were made out of nylon polyethylene and wrapped in newspaper, were placed on baggage racks or left on the floor and punctured by Aum members to release their deadly cargoes of sarin.

As planned, most of the stricken trains converged at the height of rush hour and disgorged their sick and frightened passengers.

We would like to show a still photo of some of the events on that tragic day, but we also have prepared a brief 45-second clip from a tape provided to us by the Australian federal police. This longer version of the tape describes the activities of the Australian police in Australia in investigating the Aum, and we ask that it may be made an exhibit. But we have a smaller portion of that tape which was used by the Australian police as a training tape.

The CHAIRMAN. Without objection, it will be made a part of the record and appropriately numbered.[1]

Mr. SOPKO. Just to give a brief feel for what occurred that morning and after the incident, if we could play that please.

[Videotape played.]

Mr. SOPKO. This event, Senator, succeeded in killing 12 and injuring 5,000. Some have argued, Senator, that this shows it was not a successful event since it only killed that number, although Aum's plan was also to create massive terror on the streets of Tokyo. Not only did it succeed in killing these people and injuring these people, it succeeded, even to this day, in affecting the psyche of Japanese citizens as well as the psychology of people around the world.

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[1] See Exhibit No. 16b.

It succeeded in causing panic and chaos in the station and throughout Tokyo as commuters and subway workers alike collapsed in severe fits of coughing, choking, and vomiting. It was only a fortunate mistake by the Aum in the preparation of the special batch of sarin used that day and the inferior dissemination system used to deploy it that limited the number of casualties.

Senator, we have reviewed a number of reports describing men, women, and children in panic, coughing uncontrollably, collapsing in heaps. On one platform, over 30 passengers collapsed after being overcome with fumes that were strong enough to be smelled one floor above. Subway workers and other emergency workers who first arrived on the scene quickly became victims themselves.

The Tokyo attack was first viewed as the long-prophesied attack on the Government of Japan by the Aum. However, the Japanese Government now believes that the gas attack was meant merely as a diversionary feint in anticipation of a planned government raid. The staff has learned that the police have evidence that the Aum leadership planned the Tokyo attack after they discovered that the police were going to raid their facilities in search for a kidnaped notary public.

From March 23 through September 4, 1995, the police have conducted over 500 raids on approximately 300 locations, arresting almost 400 Aum members and charging them in 240 separate cases. Many of those charged have started to appear for trials, including Asahara who was scheduled to start trial on Thursday, October 26. He fired his attorney the day before the trial started.

Despite this aggressive response from the Japanese authorities, criminal activities of the Aum did not come to an end with the Tokyo incident or the arrests.

For example, on March 30, 1995, only 10 days after the sarin subway attack, the Commissioner General of the National Police Agency was shot and seriously wounded by an unknown assailant who has now been linked to the Aum.

On April 19, 1995, in what appears to have been a copycat attack, more than 500 people were sickened and taken to hospitals complaining of stinging eyes, sore throats, nausea, and dizziness after inhaling a mysterious gas released at different places around the Yokohama station.

On April 23, 1995, 1 month after the subway incident, Murai, the Aum's Science and Technology Minister, was stabbed to death.

On May 5, 1995, the Aum struck again by attacking Shinjuku station, one of the busiest in Tokyo, with another chemical weapon. In this case, the Aum used sodium cyanide placed in public restrooms. This did not succeed, but chemical experts have estimated the amount of gas that would have been released would have been sufficient to kill between 10,000 to 20,000 people.

On May 16, the data that Asahara was arrested, the Aum sent a letter bomb to the Governor of Metropolitan Tokyo which exploded in the hands of his secretary, blowing off the fingers of his left hand.

And as late as July 4, 1995, another gas attack was attempted in Tokyo by the Aum, again involving hydrogen cyanide.

The threat still remains that other devices may be employed in the future, especially during some of the more important trials. The staff has been advised that not all of the chemicals produced by the Aum have been accounted for, nor have all the more fanatical members been arrested. As an example, as late as September during the staff's fact-finding trip, the entire city of Tokyo was festooned with wanted posters for some of the Aum members.

Until all of the fanatical members, their weapons of mass destruction, and their assets are accounted for, there is still some justification for the Japanese and the Americans to be concerned.

Mr. Edelman will now proceed and describe in detail the overseas operations of the Aum, including their activities here in the United States.

Mr. EDELMAN. One reason why we in the United States should be concerned about the Aum is because of the truly global nature of this cult. In this section we will examine the Aum's activities in 7 different countries on 4 different continents, including Russia and the United States.

Through a number of private and governmental sources, including Aum documents, the staff has confirmed that the Aum began its activities in Russia in 1991, and the organization there quickly grew to become the Aum's largest organization in the world. The first followers registered in Moscow in 1991, and in June 1992, the Russian Ministry of Justice registered the cult as an official religious organization.

There have been many allegations in the Japanese and Russian press about Aum activities in Russia. The staff attempted, but was unable, to confirm many of these allegations while in Moscow investigating this issue. Moreover, the staff has learned that U.S. Government officials themselves have been unable to confirm or deny many of the allegations. We will therefore attempt to differentiate between what we know and what the press reports.

Following the sarin gas attack on the Tokyo subway, two Russian Duma committees began investigations on their own of the Aum—the Committee on Religious Matters and the Committee on Security Matters.

The Russian Duma has reported that the Aum had 11 branches outside of Moscow and at least 7 inside Moscow. Some of the other Aum headquarters in Russia were located in St. Petersburg, Kazan, Perm, Vorkuta, Tyumen, Samara, Vladivostok, Elista, and Vladikavkaz.

On the chart,[1] which is up right now, you can see the location of many of the Aum's centers. Those are the cities marked in red. We have also put on this map the location of many of Russian's strategic facilities, particularly missile assembly plants, chemical and biological production facilities. You will notice that many of the Aum's centers were located near these important strategic facilities of Russia—we believe that that was no accident.

According to Russian press reports, the Aum was very specific in targeting its recruiting in Russia. The sect asked prospective members to choose the subjects among 24 fields they wanted to pursue in the future. Physics, chemistry, and biology were reportedly the top three areas listed.

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[1] See Exhibit No. 42a.

Based upon official Japanese documents and numerous press reports and staff interviews, the staff has confirmed that in 1992 the Aum bought radio time from one of the largest radio stations in Russia, the state-run Mayak Radio. They obtained a 3-year contract at a cost of $800,000 per year, according to a Russian press report. The staff has confirmed that the Aum broadcast an hour-long program on a daily basis over this station. These broadcasts were also relayed via an Aum radio tower located in Vladivostok which broadcast those reports to Japan every evening. Aum programs were also televised on Russia's 2x2 television station.

Even before the Tokyo sarin gas attack, the Aum had become controversial in Russia. According to Russian press reports, at the end of 1992 parents of cult members, led by a Russian Orthodox priest who claims to have deprogrammed up to 50 Aum members, initiated a civil lawsuit against the sect. On July 15, 1994, Russia's Ministry of Justice annulled the registration of the Russian branch of the Aum on technicalities having to do with their registration procedure. A few weeks later, however, the organization was re-registered by the Moscow Department of Justice as "Moscow's Aum Religious Association."

Following the subway attack, the activities against the Aum in Russia intensified. By mid-April of 1995, President Boris Yeltsin publicly ordered Russia's Prosecutor General, the Federal Security Service, and the Commission for Religious Organizations in the Russian Government to thoroughly investigate the Aum. In response to this edict, Russian press reports indicate that the Russian court that had been hearing the parents' lawsuit banned all of the Aum's activities in Russia. The court charged that the Aum was harming Russia's young people and criticized Mayak Radio and the Russian television station for allowing Aum propaganda on its airwaves. The Aum was ordered to pay 20 billion rubles, the equivalent of $4 million, to the defendants, and it lost its registration in Russia as an official religion. The group was also banned from further television and radio broadcasting. Despite these actions, an Aum official in Moscow said, "Aum will not cease to exist in Russia. We shall continue to exist in other forms, but we shall prevail by all means."

The Russian press stated that July 1995, Russian authorities began arresting Aum members. In early July, Russian authorities detained the leader of the Tatarstan branch of the Aum. On July 21, 1995, Russian law enforcement officials arrested one of the leaders of the Moscow branch of the sect, Outi Toshiyatsu, who is a Japanese citizen. Russian authorities charged Toshiyatsu with organizing groups that infringe on citizens' rights and with causing material damage by cheating or breaching confidence. There has been no trial yet of this individual in Russia.

It is clear that the Aum was interested in the technology and weapons that are available in Russia. The major proponent of the sect's expansion into Russia was the Aum's Construction Minister Kiyohide Hayakawa. He was also the mastermind of the Aum's attempts to arm itself, according to Japanese officials and cult documents.

In total, Hayakawa visited Russia 21 times from 1992 to 1995, spending a total of 180 days there. The staff believes that Hayakawa played a key role in obtaining technology and weapons from Russia. Hayakawa helped to purchase a Soviet-made MI–17 helicopter and invited Russian engineers to Japan to help train sect members to maintain the helicopter, this according to official Japanese documents.

The staff has confirmed that the helicopter passed through Japanese customs in 1994 via Azerbaijan Air and that the Aum subsequently inquired about certification for a larger MI–26 helicopter and the requirements to fly such a helicopter to Japan from Russia.

Japanese police sources also allege that Hayakawa brought pistol models to Japan from Russia in the spring of 1994 in order to attempt to produce those pistols in Japan. These sources also claim that documents seized from Hayakawa upon his arrest included blueprints for the Soviet Kalashnikov assault rifle.

There have been many allegations that Aum members may have received military training in Russia.

Official Japanese documents and press reports state that a tourist brochure printed by a company known as Devenir Millionaire, an Aum-affiliated travel company located in Tokyo, described a tour of Russia that included shooting exercises at Russian military facilities. The brochure claimed that the exercises would be performed under the supervision of former Spetznaz members of the Russian armed forces.

Press reports claim also that Aum Defense Ministry leader Kibe and Secret Unit member Furukawa underwent comprehensive pilot training in Russia. The Aum paid Russian instructors at Moscow's "Airfield Number 3" $15,000 each for a rigorous training course. Furukawa was in charge of planning military training in Russia under a special Russian unit. As indicated elsewhere in this statement, the staff has also confirmed that Kibe received helicopter training in the United States, in South Florida in late 1993.

Russian Defense Ministry officials have denied that any training took place at their official facilities. In contrast, though, the staff found Russian and Japanese press reports which provided the following information:

Russian military sources told Japanese reporters that Asahara had inspected a military base near Moscow in the summer of 1993, although they again denied that training took place at that time. Together with a number of followers, Asahara met military officials there for talks, and inspected the grounds.

The chief of staff of the Far Eastern Military District of Russia has publicly denied rumors that Aum members were trained as pilots at his base but admitted that there are many private firms and air companies with helicopters at their disposal.

In addition to obtaining conventional arms and training in Russia, the Aum apparently saw the country as a source for more exotic weapons. At the time of his arrest, Hayakawa had information on him about a gas laser weapon. His documents referred to the name of a Russian city where "there is a weapons market" and noted the distance of that city from Moscow.

Hayakawa's documents also indicated that the sect was interested in obtaining a space-launch rocket, this again according to

Japanese press. According to these accounts, Japanese officials said that the documents include a reference to a Russian proton rocket and reference its prices and the need to build a base in Japan.

The Aum's interests apparently extended to even the most devastating of weapons. There are references in the documents seized from Hayakawa as to the purchase of nuclear weapons. The documents contain the question: "How much is a nuclear warhead?" The documents then go on to list several prices. It is unclear to the staff whether the references in these notebooks are reflections of actual discussions or negotiations or merely the musings of Minister Hayakawa.

Much has been written in the press about the relationship between the Aum and officials of the Russian Government. Most of these allegations have been denied in whole or in part by the officials in question, and little has actually been confirmed by either U.S. or Japanese Government officials.

The following, however, has been reported by both Russian and Japanese press sources: That Asahara led a delegation of 300 Aum members to Russia in March 1992. During that trip, Asahara purportedly met with Parliament Vice President Aleksandr Rutskoy and former Russian Parliament Speaker Ruslan Khasbulatov.

It has also been reported that Russian Parliamentarian Vitaliy Savitsky, the chairman of the Duma's Religious Affairs Committee, told his fellow parliamentarians, "his committee seriously suspected that the Aum Shinrikyo had been assisted in its penetration into Russia by Russian intelligence services."

It has been reported that the premier nuclear research facility in Russia, the Kurchatov Institute, had Aum followers among the employees.

During 1992 to 1993, Aum leaders reportedly visited Russia and approached Russian science officials seeking laser and nuclear technologies, and Shoko Asahara reportedly met with Nikolay Basov while in Moscow in 1992. Mr. Basov is the 1964 Nobel Prize winner for his research on the principle of laser technology.

It has also been reported that the Secretary of the Russian Security Council, Oleg Lobov, met with the Aum and may have received large sums of money from the Aum.

A Russian known to be a secretary of Lobov's sent facsimiles to Hayakawa in Japan, and Hayakawa reportedly visited Lobov during his visits to Russia throughout the 1992–95 time period.

Lobov reportedly met with Aum officials on his own without informing the Russian embassy or asking its advice. Sources say that this February 1992 meeting was agreed to without the participation of the Russian Foreign Ministry or intelligence services prior to Lobov's trip to Japan. No leading embassy staffers were present at that meeting.

All of the officials have denied the allegations that they helped the Aum. The staff, however, has discovered photographs that appeared in Aum publications purporting to show Rutskoy, Khasbulatov, Basov, and Lobov meeting with Aum leader Asahara.

The staff has also reviewed official Japanese documents which do corroborate limited aspects of the above reports. These documents state that in December 1991 a Russian business person visited Russia with Hayakawa, then the cult's administration director, and met with Lobov, the President of the Russian-Japan College, the present Russian Secretary of the Security Council, Mr. Muravjbv, the Secretary General, and Mr. Khushchov, the chairman of the Board of Trustees.

In February 1992, Mr. Lobov was invited to Japan by Nissho-Iwai Company, Ltd., and met with Asahara.

In March 1992, after chartering an Aeroflot aircraft, a delegation of 300 cult members headed by Asahara visited Russia and met with Rutskoy, Khasbulatov, and Lobov.

Again, these last few items are items which have been confirmed through official Japanese documents.

In addition, the staff has been able to confirm, through its own visit to Russia and a visit to the Kurchatov Institute, that an employee of the institution was and still is a member of the Aum.

The Aum's most intriguing presence may have been in Australia. The staff has confirmed that the Aum was in Australia from April 1993 to October 1994. From documents provided to the staff by the Australian Federal Police, the staff determined that the cult purchased a 500,000-acre sheep ranch in Banjawarn, Australia, located approximately 375 miles northeast of Perth, Western Australia's state capital. In order to purchase this farm, the cult formed a front company named Clarity Investments, and another company, Maha Posya Australia, Ltd., in 1993.

The Australian Federal Police gave the staff documents confirming that in April 1993 three members of Aum Shinrikyo arrived in Perth from Tokyo. The three included Construction Minister Hayakawa, who was also the person instrumental in setting up the Aum's operations in Russia, and Intelligence Minister Yoshihiro Inoue. The two hired an Australian citizen of Japanese heritage who was a real estate agent based in Perth, and with her viewed remote farming properties in Western Australia.

Ultimately, the group decided on the property in Banjawarn Station, an area where there is a known uranium deposit. In April 1993, Hayakawa allegedly offered to purchase this property for cash; however, the offer was refused by the owner. Following this refusal, the Aum formed its two front companies, and through these companies managed to purchase the property for approximately $400,000. The Aum subsequently purchased eight mining leases in September 1993 for approximately $4,700 each.

Shortly after purchasing the property, Hayakawa met with a consulting geologist. During that meeting he told the geologist that the Aum wished to obtain a ship and inquired what price they could expect to pay. Hayakawa also mentioned at the meeting that the Aum wanted to export uranium ore from Banjawarn Station in 44-gallon drums.

Shortly thereafter, Hayakawa and another Aum member by the name of Maki engaged an Australian travel agent to make arrangements for six 4-wheel-drive vehicles and a chartered aircraft. The staff has confirmed that shortly thereafter cult leader Shoko Asahara arrived in Perth with 24 followers from Japan. The Aum traveled with chemicals and mining equipment on which they paid over $20,000 in excess baggage fees. According to the Australian police report, among the baggage was a mechanical ditch digger, picks, petrol generators, gas masks, respirators, and shovels. A customs duty of over $15,000 was paid to import these items.

Because of the large amount of excess baggage being brought in by the group, Australian Customs searched the entire group. This search revealed 4 liters of concentrated hydrochloric acid, including some in containers marked as hand soap. Among the other chemicals that Australian Customs officials found were ammonium chloride, sodium sulphate, perchloric acid, and ammonium water. All of these chemicals and some of the laboratory equipment were seized by the Australian authorities.

Having lost their chemicals to the authorities, the Aum members used their real estate agent and their geologist—both of whom were Australian citizens—to obtain new chemicals from chemical wholesalers. These chemicals were obtained either in the name of Maha Posya or in the name of the real estate agent's company.

The Aum also tried to hire earth-moving equipment from a mining operation at an adjoining station. The mine operators refused to lend their equipment without a mine worker to operate it, a demand which the Aum refused. A backhoe ultimately was hired by the Aum without an operator from a rental company for 3 days, from September 16–18, 1993. Digging and evidence of earth-moving equipment has been found on the property.

The Aum also established a laboratory on the Banjawarn Station property which was stocked with computers and various digital and laboratory equipment. Witnesses told Australian Federal Police that the laboratory contained laptop computers, digital equipment, glass tubing, glass evaporators, beakers, bunsen burners, and ceramic grinding and mixing bowls.

Shortly after the sarin gas attack in Matsumoto in June 1994, the Banjawarn Station property was offered for sale. Mr. Maki handled the details of the sale and seemed very anxious that the sale proceed quickly. The property was sold in late July 1994 for $237,000, almost $165,000 less than what the Aum had paid for it only a year earlier.

The Aum's activity on the property is partially known and, to some degree, still a mystery. Various police sources indicate that Hayakawa was interested in extracting uranium from Australia for the development of weapons. Documents seized from Hayakawa include some 10 pages written during a 1993 visit to Australia which refer to the whereabouts of properties of uranium in Australia, including one reference praising the quality of the uranium in the state of South Australia.

It appears, however, that the Aum was interested in more than just mining on the Banjawarn property. The chairwoman of the aboriginal community living near the Banjawarn Station said that she and other aborigines saw about 5 people wearing full-length suits and helmets on the remote site in late August of 1993. The suited sect members were standing by a twin-engine airplane and others were in the plane.

In March 1995, shortly after the Tokyo subway attack, the Australian police were invited to the sheep station by its new owners who had found papers with Japanese writing and various chemicals on the property. The chemicals that the police found could have been used for mineral processing or to make an irritant gas.

The current owners of the property have stated that the Japanese occupants had a number of gas masks in their possession but that they took them when they left. One gas mask was left behind and seized by Australian police. Paper dusk masks were also located in a plastic bag bearing Japanese writing.

The staff has confirmed that the Aum conducted experiments with sarin on sheep at its Banjawarn Station property. The Australian Justice Minister said that members of the Aum tested sarin in Australia before the Tokyo attack. He said that tests on wool and soil samples taken from the Banjawarn Station had confirmed traces of the chemical. The Justice Minister stated that sarin residue had also been found in and near a group of about 29 dead sheep that were located on the property. Specifically, traces of the acid that results when sarin breaks down was found in the soil and in the wool of the sheep.

In addition, authorities found a document written in Japanese and titled "Banjawarn Station." This document suggested the sect may have been experimenting on the sheep. The document contained notations for classifying dead or injured sheep by using unique Japanese markings.

In addition to its activities in Russia and in Australia, the Aum also had a presence here in the United States. The Aum officially came to the United States in late 1987 when it incorporated an office in New York City under the name Aum USA Ltd., a not-for-profit corporation. Although the office purported to promote the cult's book sales and recruitment of followers, the staff's review of documents and records and interviews of the manager of the office establish that the office was also acting as a purchasing agent for the cult as it attempted to obtain high technology equipment, computer software and hardware, and other items from the United States.

According to corporate records, the New York City office was initially organized by Fumihiro Joyu, an individual who took over for Mr. Asahara after he was arrested. Mr. Joyu is himself now under arrest in Japan.

The articles of incorporation were amended in 1988, and at that time Mr. Asahara himself appeared as a director of the corporation. The company was a tax-exempt organization and registered as a charity in New York.

In the early 1990's, according to corporate documents, Yumiko Hiraoka became the primary manager of the Aum's office and all office-related documents thereafter were in her name. Later this morning, Ms. Hiraoka will testify before the Subcommittee.

Despite a claim of aggressive recruitment by Hiraoka, the cult maintained an active membership of less than a few dozen devotees in the New York area.

The staff's investigation, though, reflects that the cult's New York office was actively involved in the procurement and attempted procurement of high technology items with possible military use. Though most of the documents at the Aum's headquarters were taken by the cult after the Tokyo incident, entries in the Aum's ledgers reflect various payments to technology and laser companies. The cult utilized various corporate entities to facilitate these transactions, including its primary alter ego, Aum USA Company, and the company Maha Posya.

In August 1993, the cult attempted to obtain a Mark IVxp interferometer from the Zygo Corporation in Middlefield, CT. This device is a laser measuring system primarily used for measuring lens systems, optical components, and flat and spherical surfaces. It is a dual commercial/military use item and has numerous applications, including the possible measuring of plutonium spheres. The U.S. Commerce Department prohibits the export of this machine to certain countries, including Libya, Iran, North Korea, and Cuba. The machine, though, is not prohibited for export to Japan.

In August of 1993, representatives of Zygo received contacts from the Aum, including telefaxes from Hiraoka. On August 23, Zygo issued a price quotation for the system of over $102,000. Additionally, the Aum requested a vibration isolation table from Zygo which, with modest reconfiguration, could also be used to measure spherical surfaces such as plutonium. Neither of these purchases, however, was ever consummated.

In 1994, the Aum did complete two sales transactions with Lydall Technical Paper of Rochester, NH. These transactions, which totaled approximately $32,000, were for HEPA media, which is an air filtration media. The staff would note that this media is used in so-called clean rooms and that the Aum itself constructed clean rooms at their compounds in Tokyo to facilitate their handling and production of sarin and other chemical and biological weapons.

In January 1995, the Aum purchased molecular modeling software from a company known as Cache Scientific of Beaverton, OR. This shipment cost approximately $2,900 and consisted of basic software, including a manual and computer diskettes.

In a similar effort, the Aum contacted Biosym Technologies, Incorporated, a molecular design software company located in San Diego. During February and March of 1995, Aum members negotiated with Biosym for the purchase of a sophisticated computer hardware system and over 20 different software programs. This hardware was purchased for $47,000.

Following the Tokyo attack, the computer hardware was returned to Biosym, but the disk drive containing the software was missing. Allegedly, this disk drive was taken to Japan. The drive ultimately was returned to Biosym by the Aum, but it is unknown at this time whether the sect was able to download the information that the drive contained.

In March 1995, Mr. Hiramatsu contacted sales and technical representatives of Hobart Laser Products. This company manufactures extremely sophisticated lasers for industrial and scientific applications including cutting and welding. According to the company, for approximately 2 weeks leading up to March 18, 1995, the Aum negotiated for the purchase of a 3-kilowatt laser welder with installation support. This system costs approximately $450,000.

From discussions with Hiramatsu and Murai, the operating parameter set forth by Murai allowed Hobart to draw the following technical conclusions:

One, that the Aum wanted the laser to be operable from within a glove box, a sealed-room environment outside of which the operator could manipulate the equipment through the usage of thick gloves. Experts have advised the staff that this is particularly useful if biological toxins, aerobic or contact poisons, or nuclear emissions are of concern.

Also, Murai indicated the laser would be used to weld aluminum oxide. The welding was to be of canisters, and perhaps canisters within canisters.

Of primary concern to Hiramatsu and Murai was the rapid delivery of this expensive laser. Hobart representatives were told that it was required immediately and that cash was available.

When the company informed the Aum members, however, that this was custom-made equipment and that it would take some months to provide to the Aum, the cult quickly cut off discussions on March 18, 1995, which was just 2 days prior to the Tokyo attack.

Also in March of 1995, Mr. Hiramatsu contacted Tripos, Incorporated of St. Louis, Missouri. This company specializes in molecular design software that is used by highly trained physicists and chemists to develop new therapeutic drugs in the pre-clinical design phase. It can also be used to research and develop biological toxins.

Beginning in June of 1994, the Aum established a relationship with a purchasing agent on the West Coast to assist it in obtaining military technology and hardware. The company, International Computers and Peripherals, was a U.S. business in California formed to export computer parts to Japan. The partners in the venture, Phillip Rupani, Cameron Hader, and Kevin Singh, sought Japanese companies as potential clients.

Through telefax, telephone, and personal contacts, ICP developed a business relationship with Hiramatsu and Tsuyoshi Maki and began to obtain computer parts presumably for the Aum's computer stores in Japan. However, near the end of 1994, Hiramatsu began to make requests for other items from ICP. Initially, he wanted to obtain thousands of serum bottles, hundreds of mechanical fans, and equal amounts of camcorder batteries. As Mr. Sopko indicated earlier, these are precisely the types of items which were utilized to make the deployment devices used in the attache cases which were found in the Tokyo subway system.

Later, Hiramatsu began to inquire about obtaining laser equipment, survival equipment, and similar items. At one point, Hiramatsu asked whether ICP knew how to obtain arms, a plane, and container ships. Hiramatsu told Rupani that the arms were for a customer in the Middle East. The staff has deposed Mr. Rupani, one of the partners in this company, and with your permission, we would like to play a very short 2- or 3-minute excerpt from that deposition in which he discusses his contacts with the Aum.

[Videotape played.]

Mr. EDELMAN. That was just a brief excerpt of a longer deposition of Mr. Rupani, and we would request that the complete video deposition be made an exhibit to the record.[1]

Senator NUNN. Without objection, it will be made part of the record and appropriately numbered.

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[1] See Exhibit No. 33.

Mr. EDELMAN. In January of 1995, the staff has learned that Mr. Maki and Mr. Hiramatsu began to seek military equipment from sources in the United States. During that month, Mr. Maki attended a Winter Market Show at the Reno Convention Center in Nevada at which time he made contact with a representative of Rothco Company, a firm in Smithtown, NY. Mr. Maki inquired about obtaining survival equipment through Rothco and expressed an interest in obtaining gas masks.

A week after this meeting, Rothco received a request wherein Mr. Maki requested various items, including 200 military-style knives and various types of gas masks. Rothco ultimately shipped two gas masks to the Aum in Japan as samples, a Russian mask and an Israeli mask. Following that shipment, Rothco received a request for 400 of the Israeli gas masks with filters, and the company's account was credited with over $3,000 in payment for those gas masks. It was requested, however, that Rothco send the gas masks not directly to Japan, but to ICP, Mr. Rupani's company in California, and that that company would act as a freight consolidator.

Two days after the Tokyo attack, sources from Japan contacted ICP and told the company representative that they should stop selling to Maha Posya because they were involved with the Aum and were killing people in Japan. At that time, Mr. Rupani recalled the Maha Posya shipment from the freight forwarder and returned it to ICP in California. Mr. Rupani opened the shipment and discovered that it did include the gas masks in it.

As we saw on the large chart of the Aum's world activities, the Aum was in numerous countries aside from Russia and the United States. They had an office in Germany. They had businesses in Taiwan. They even had a tea plantation which they ran in Sri Lanka. So this was truly an organization whose tentacles reached around the globe.

The threat posed by the Aum today is unknown. It still has substantial assets, thousands of devotees, and authorities are unsure whether its weapons and weapons potential has been completely neutralized. Furthermore, the anti-Western rhetoric and the Armageddon prophecies that fueled the tragic and near-cataclysmic incidents in Tokyo and elsewhere are still evident.

The cult's rise and its efforts to obtain and deploy weapons of mass destruction raise numerous policy issues, however, that extend well beyond the specific threat posed by Shoko Asahara and his disciples of the Aum Shinrikyo. The Aum was merely one example, a case study, of what may be the most dominate and emerging threat to our national security today.

That concludes our formal statement, Mr. Chairman. We do have a number of exhibits in a bulky form which we would request be made part of the record.[1]

Senator NUNN. Without objection, they will be part of the record.

I would like to thank you, Mr. Edelman, Mr. Sopko, and also Rick Kennan, Mark Webster, Scott Newton, Renee Pruneau-Novakoff, and on the majority side, Harry Damelin, Mike Bopp, and Steve Levin for a very, very thorough job. I don't have a lot of questions. We have other panels, and we have a third witness today that you have alluded to. But if you could summarize, distinguishing between what type of weapons they actually had and had developed and those weapons that they were working on, could you summarize that for us, the weapons they actually possessed that we know about and the weapons that they were working on that they never did actually deploy?

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[1] The exhibits appear in the Appendix beginning on page 368.

Mr. SOPKO. Well, from the chemical and biological point of view, Senator, we know they had and deployed sarin and VX. Those are the primary ones. They were working on botulism and anthrax. There is some debate—and we haven't confirmed it—that they could have had both of those, but I don't believe they intentionally deployed it. There may have been accidental deployment.

They also had a Russian helicopter that they were attempting to put a dispersal device on. They had drone aircraft that they were going to put a dispersal device on. They had——

Senator NUNN. Drone aircraft, unpiloted small aircraft that could carry chemical or biological——

Mr. SOPKO. That is correct, Senator. It has a tank in it, and then it is used to spray. They also had AK–47's and were building more AK–47's. We know they had some Russian-made pistols that they obtained.

Now, they were trying to obtain laser weapon technology. They were also trying to obtain some other military technology like tanks and other hardware, but they weren't able to do it.

Senator NUNN. We have no evidence they actually had laser weapons at this stage?

Mr. SOPKO. No, Senator.

Senator NUNN. No evidence that they had gained access to any nuclear device at this stage?

Mr. SOPKO. No, Senator, although they were looking for nuclear material and nuclear scientists to help them.

Senator NUNN. Do we have evidence of how much uranium mining they did in Australia, if any?

Mr. EDELMAN. There is evidence that they did some excavation in Australia. It has not been confirmed whether they actually took any uranium ore out of Australia, and it is not clear the total amount of ore, if any, which they may have been able to extract from the ground.

Senator NUNN. So we don't know that.

Mr. EDELMAN. We don't know what, if anything, they took from Australia.

Senator NUNN. In summarizing, what weapons do we know that they actually got or weapons material or sophisticated equipment actually had delivered to Japan from the United States as opposed to what they were trying to get? What do we know about in terms of what actually got through to Japan?

Mr. EDELMAN. In terms of actual weapons, I don't believe we have any evidence that there were actual weapons that they obtained from the U.S. and sent to Japan. They did obtain some technology which they could have utilized in making their weapons, in particular in making chemical or biological agents.

Senator NUNN. But most of what they were trying to get in this country, though, was intercepted after they became known following the March attack, was it not?

Mr. EDELMAN. There was at least one instance where material was intercepted by law enforcement authorities. In other instances, the deals which the Aum was trying to arrange with various companies fell through, either because of price or for other reasons. The companies may have started to become suspicious of why these people wanted the items.

Senator NUNN. But most of the records were taken out of their offices before we had a chance to examine them, were they not?

Mr. EDELMAN. That is correct. From our interviews with the manager of the New York office, we were told that within a month after the subway attack, the key cult members from Tokyo came to New York, went through all of the files there, and took a box full of documents, which primarily contained all of the records of their business transactions here in the U.S.

Senator NUNN. How did you discover the companies you have listed here? You listed a number of American companies that they had tried to procure various materials and technology from. How did you find those companies?

Mr. EDELMAN. There were still some records left in the New York office, including some accounting records which made references to various companies. Our staff then followed through on those names, contacted the companies, interviewed principals from those companies, and through that method obtained somewhat of a picture of what the Aum's activities were.

Senator NUNN. But there could be a lot of other companies that were in the records that you did not see. Is that right?

Mr. EDELMAN. It is very possible that there were many more companies that we do not know about that the Aum may have been dealing with here in the U.S.

Senator NUNN. So we really don't know how much may have been delivered to Japan from the United States?

Mr. EDELMAN. No. We don't know how many companies they may have contacted, how many different devices they may have obtained, and how much they may have been able to get to Japan.

Senator NUNN. Do we know whether any of the companies that we do know about violated any of our export laws?

Mr. EDELMAN. There was the one shipment when the sample of two gas masks were sent to the Aum in Japan. That shipment would appear to have violated export restrictions. We will have representatives from the U.S. Customs Service testifying tomorrow. They could better address that. But from what we have been told, shipment of gas masks would require some sort of license or authorization, and that apparently was not obtained in this instance.

Some of the other items which the Aum was seeking to acquire were in one sense or another restricted, but the group never reached the stage of actually trying to get them out of the country for those restrictions to——

Senator NUNN. Are there any indications that the Aum actually used biological weapons?

Mr. EDELMAN. There are a couple of reports. I think Mr. Sopko alluded to one report of perhaps an accidental release of biological toxins at the Tokyo headquarters. There has been another report in the Japanese press which recites facts concerning a device which was used by members of the Aum, a truck or a car with which they purportedly drove around the Imperial Palace in Japan with a device that sprayed botulinum toxin. According to these press reports, Mr. Asahara, Mr. Hayakawa, and Mr. Joyu were all present in that vehicle as it circled the Imperial Palace, and this took place in the summer of 1993

Senator NUNN. But no damage was done?

Mr. EDELMAN. According to the reports, there was no damage done because the toxin itself loses its toxicity once it hits the air and sunlight and daylight, so that there was never any damage.

We have not been able to independently confirm the veracity of these allegations, however.

Senator NUNN. In the course of your investigation, you have talked to a lot of our own law enforcement agencies, intelligence agencies, emergency preparedness agencies, Secret Service and so forth. What is your judgment about how prepared the United States is in terms of our law enforcement agencies in particular to handle a similar type threat in this country?

Mr. SOPKO. Senator, the verdict is out on that, unfortunately. We do know that there are contingency plans to handle that type of threat and to handle that type of incident. Those will be discussed tomorrow by the government witnesses.

We have some concerns about the ability of the U.S. Government and its many agencies to respond to such an incident. We have some concerns about the intelligence and law enforcement coordination to respond to that incident. It is good, but it could be better.

We have some concerns about our medical capabilities to respond to that incident.

Senator NUNN. The Japanese were pretty well prepared medically. Is that right?

Mr. SOPKO. They were pretty well prepared, and I don't believe we would have been as good as they were if an incident like that had happened. Now, that isn't to condemn our response, but the Japanese, you have to realize, had an inkling something was going to happen. They also have a different society and a different structure in responding to these type events. They also have a long history of disasters there like the earthquakes in which they have a response team prepared.

Now, sometimes they don't work as well as they would want to, but they seem to have had their medical response, their health care and public service response to the incident put together quite well. That probably causes more concern than even the law enforcement and intelligence capabilities as when you look at our response from the medical point of view here in the United States.

Senator NUNN. Wouldn't you have to have certain treatment available for a chemical attack near the scene in order to be able to cope with it?

Mr. SOPKO. That is correct, Senator, and you have to educate the health care providers to be on the lookout for these type of incidents, especially a biological attack. Again, our next panel will discuss that in more detail, and Dr. Young from the Public Health Service will also discuss our medical response capabilities.

Senator NUNN. After looking at what happened in Japan, what is your judgment about whether such an event could happen in the United States and the likelihood of it in the next few years?

Mr. SOPKO. Senator, all of the experts we talked to said it is really not a question of if but just rather when an event will occur here in the United States.

Senator NUNN. Most likely chemical, biological, nuclear? What is most likely?

Mr. SOPKO. Senator, probably most likely either chemical or biological, not nuclear, just because of the difficulty of putting together a nuclear device versus a chemical and biological device, which you can put together. I mean, Senator, we even found material on the Internet which, in a matter of seconds, one of our staffers just pulled this off the Internet. It is called the "Killer Cults: Wake Up and Smell the Poison." It describes how to make a sarin weapon, describes how to make biological weapons. And that was only in a matter of minutes we pulled this up. That is the unfortunate thing. There is so much material out there already in the public domain.

Senator NUNN. If you listed three or four things that we need most to make priorities in terms of being prepared to prevent this kind of occurrence but to deal with it if it ever occurred, what would they be?

Mr. SOPKO. Well, intelligence is the key, Senator, and devoting more resources to our intelligence efforts and then also cooperation between our intelligence community and the worldwide intelligence community because a terrorist event of the future is going to be international in scope. So, international cooperation of intelligence and law enforcement agencies is a second key priority.

The third would be to devote more resources and training to the response to an incident. That is where I think the staff—and I think Mr. Edelman will agree with me—feel the most concern. Are we able to get highly trained fire crews and emergency crews out there to an incident like this and not have them become the victims themselves? I think those three areas would be probably the three areas I would recommend.

Senator NUNN. At this point in time do we have law enforcement that is equipped with chemical capabilities in dealing with this, gas masks, etc.?

Mr. SOPKO. Senator, we do have those capabilities. Whether they are adequate or not can best be answered probably by the upcoming witnesses.

Senator NUNN. Mainly in our military, though, isn't it?

Mr. SOPKO. Yes, Senator. Our military is very well prepared for that. They are up to speed on that. It is the question—and they can support a civilian response to that. But the question is, Will the military be there if an incident happens in some subway? It is going to be some local fire department or local EMS crew that is going to show up first. It is going to be a doctor or a series of doctors in emergency rooms who are going to notice people coming in with some type of illness first. And those are the people who have to be educated and trained and equipped for this type of incident.

Senator NUNN. Thank you. Senator Cohen?

Senator COHEN. Thank you, Mr. Chairman.

You mentioned that there were Aum devotees in Russia. Are there any, to our knowledge, in the United States?

Mr. EDELMAN. From our interviews with the manager of the Aum's New York office, the number appears to be limited. Although some of the authorities that we spoke with claimed that there could be as many as 200 Aum members here in the U.S., we have not found evidence to support that, and we believe that the figures that we were given by the Aum's New York manager herself of perhaps a few dozen is probably closer to accurate.

Senator COHEN. Well, you mentioned that the timetable for this conflict that has been preached by Hayakawa was accelerated to November 1995. We also may recall that following the bombing in Oklahoma, word was spread by some of the groups in this country that the U.S. Government was, in fact, responsible for the gas attack in Tokyo.

Now, was that due to Aum members spreading that? Was that due to local militia groups contributing to that particular view of the U.S. Government's activities? How do you attribute that story?

Mr. EDELMAN. The Aum has continuously accused the United States of carrying out or seeking to carry out chemical and biological warfare against it. There were times prior to the Tokyo attack when foul odors were detected around their compound, Kamikuishiki near Mt. Fuji, where people were found gagging and coughing. The Aum in response to that claimed that their facilities had been attacked by the U.S. military and that they themselves had been sprayed by the U.S. military with chemical agents.

Senator COHEN. The question I am asking is whether or not the Aum followers, to the extent they exist in the United States, were responsible for planting that notion with some of the militia groups in the United States who in turn started to circulate literature that the United States was responsible for that.

Mr. EDELMAN. I don't think we have evidence of direct contacts between the Aum in the U.S. and U.S. militia groups. We were told by the New York manager that after the Tokyo attack, she received a call from the hierarchy in Japan and was given instructions as to how to deal with the media in the U.S. if they should call and ask about this attack on the Tokyo subway system. And as well, the Aum representatives in other countries were given a statement by Asahara to give to the media disclaiming the Aum's responsibility for this.

Mr. SOPKO. Senator, if I can add, we do know that the Aum went out and tried to hire U.S. experts after the Tokyo incident to go back to Japan and appear on TV and to give news reports saying that this could not have been an Aum-related incident but was, rather, a military incident by either the Japanese or U.S. military. So we know they attempted—we actually have the toll records of some of the calls made to U.S. officials—not officials, but U.S. academics. Now, no one took that offer, but they were attempting to do that to manipulate them, at least the Japanese media.

Senator COHEN. You indicated that we will hear during the course of these hearings some testimony perhaps that there may have been some kind of intelligence failure on our part. The question I had is: Between June 1994 when the Matsumoto incident occurred and December 1994, was the U.S. Government told by the

Japanese Government that sarin was involved, or was it told that it was simply an industrial accident?

Mr. SOPKO. Senator, in an open setting, I am not going to be able to answer that question.

Senator COHEN. All right. We will wait for a closed setting.

Mr. SOPKO. Yes. I would like to answer, and we can give you a briefing, and I think our intelligence authorities can—but I believe I am in an area which I don't think I can answer.

Senator COHEN. Will you also be prepared to brief the Committee on what cable traffic, if any, came from our Embassy in Japan concerning this? Even though this is an issue that was not followed closely in the United States, it was followed very closely by the Japanese press. And I would be interested in having the staff reveal, to the extent you have any knowledge about what kind of cable traffic came back from our Embassy and what the assessment was by our Embassy in Tokyo.

Mr. SOPKO. We would be more than happy to do that, Senator. We do have some unclassified cables that we can also provide, so we do know there was some reporting on the incident.

Senator, one thing I can say is that from our discussions with every major U.S. law enforcement and intelligence agency, they all, to a man, and woman, said the Aum was not on their radar screens until Tokyo. Then all of a sudden it was on our radar. We got that from everyone we talked to.

Senator COHEN. I am not drawing a parallel, necessarily, but you may recall when they had the anthrax disaster in Sverdlovsk, the Soviet Government at that time claimed it was simply an accident, a case of tainted meat. We learned years later that it was quite to the contrary. So I would be interested in finding out whether or not there was any initial reaction this may have simply been an industrial accident as opposed to an identification of sarin being involved.

Senator NUNN. Are you speaking of the first attack, the Matsumoto attack?

Senator COHEN. Yes, Matsumoto, the first attack.

Another question Senator Nunn has raised concerns how do we detect. Our biggest problem, it seems to me, is not necessarily detection, but it still presents a problem. If, as Senator Glenn in his opening remarks pointed out, you could have a facility the size of this room producing these toxins, then it is going to be very hard to detect them worldwide. We ran into this problem some years ago with Libya, in Rabat. You may recall that the Libyans at that time claimed it was simply a pharmaceutical facility, which raised serious questions in our minds since you would be hard pressed to justify why you have surface-to-air missile sites all around a pharmaceutical production facility. But, nonetheless, we were well aware of what was being produced at that plant. There may be more in production today, even.

We can point to all of the other countries who are high on our list of terrorist-sponsoring nations, so we know that there may be a large number of countries developing both chemical weapons and biological weapons, and I would point out that even though we have agreements with Russia and others, they seem to be in violation of those agreements even as we speak. So assuming we get treaties that are ratified, we still have the problem—I am sure Senator Lugar will confirm—of monitoring compliance with those treaties, which is going to be no easy task, particularly since we are dealing with something that you can manufacture easily. In fact you could even buy by mail order for about $35 in this country, some of the toxins we are talking about.

So it is a question of how do we detect worldwide what is going on, and then how do we detect at home what is going on. And assuming you can detect it, then you have the question in dealing with it here at home of how do you resolve the conflicts between our civil liberties and the need for order.

Mr. Chairman, I recall back in the late 1970's attending a conference in Germany that addressed the threat of international terrorism. An industrialist by the name of Schleyer had just been assassinated and found in the trunk of his Mercedes. And at this conference in Germany, which was my first trip, I was rather surprised with the level of security. Helmut Schmidt and Henry Kissinger were in attendance, among many other people. And the hotel was surrounded by armored personnel carriers, and every police officer was armed with a submachine gun. And I wondered at that time would that level of security ever have to be necessary in the United States, and would it be tolerated in the United States. And that is something that has troubled me over the years in terms of what level of security we will insist upon as we try to wrestle with the threat, the ever increasing and looming threat of international terrorism.

I don't know how we resolve that. We talk about law and order. My own intuition tells me at some point in time we will reverse it and talk about order and law, because I think people will demand that we protect them, that we preserve their lives, and have to reconcile the balance in favor of the preservation of life over that of civil liberties. But that is precisely the threat that international terrorism or domestic terrorism poses for all of us, and it is not one with which we have yet come to grips, Mr. Chairman.

So we need more intelligence, and we will get more intelligence. We need more cooperation between ourselves and other nations such as Russia and other countries that they may be supporting, directly or indirectly. We need to have better protective devices, but as we look back now at the threat of nuclear war back in the late 1940's and early 1950's when we were taught to duck under our tables, to hide from the blast and not look out the windows at the light, and we look back now with some astonishment that we could have been so naive that that was going to protect us. Similarly, we now face the prospect that we may in each house have to have a gas mask, that we may have to have protective devices in our basement in order to respond adequately to the kinds of attacks which I believe are more probable than not. They are more probable because of our lack of agent detection systems. They are more probable because of our lack of vaccines and protective equipment, and the ease with which these toxins can, in fact, be dispersed in our society.

So we are going to face a different type of threat and the notion that somehow we all have to have protective devices or the government will have to have an adequate supply of these kinds of devices raises the specter of another dimension.

Thank you very much, Mr. Chairman.

Mr. EDELMAN. If I could, Senator Cohen, your point about detection is particularly difficult in a case of a group like the Aum, because as you pointed out, with the Libya case you could have surveillance satellites that find those missile sites around the facility. But in the case of the Aum, how does one know that a building that a religious group says is a Buddhist temple is not, in fact, a chemical weapons plant?

Senator COHEN. For a very small amount of money, about $35, you can actually purchase botulinum toxin by mail order. Of course, it can be extremely lethal. If you take 10 pounds of tularemia, you can destroy human life within 100 square kilometers compared to 50,000 pounds of chemical weapons to achieve the same effect. You can—well, I won't go into it in open session how many ways there are in which to disperse this, but I think that this is an extremely important subject matter, Mr. Chairman. You have been working at it a long time, and I think it is long overdue that we raise the nature of the threat, the degree of cooperation we are going to have to have. And notwithstanding treaties, I guess my major point is this: We have treaties and we have agreements with some of our major partners in peace. They are still violating to this day—they are violating their word and their commitment, both in chemical weapons and especially in biological weapons. So we have to call attention to that, in open session if possible, in closed session if necessary.

Senator NUNN. Senator Cohen, you make very, very good points here. Senator Lugar asked the question in his opening remarks about what will we ask ourselves about what we should have done after we have the first one of these chemical attacks. And I think that is the question we need to pose now.

I think it is imperative that we draw a balance between civil liberties and protecting the lives of our people before something like this happens, not wait until after it happens. And then you always have overreaction. I think it is indicative during the Cold War when most of us in the national security field realized that the President of the United States might have to respond to a nuclear attack immediately without time for Congress to even consider or debate the matter of declaration of war, that in effect, de facto, the President of the United States was ceded authority to respond with massive retaliation to a nuclear attack against the United States, with no meeting of Congress, no debate, nothing.

When we get to lesser contingencies, we have the big debate, as we will appropriately do in the case of Bosnia, and as we appropriately did in the case of the Persian Gulf. So the authority that will be ceded to the executive branch and in turn to law enforcement and intelligence will depend on whether we get in front of this question and prevent it or whether we wait until it happens, in which case the demand for a whole lot more authority, notwithstanding civil liberties concerns, will be there. If you ever have a chemical attack in the United States where thousands of people are killed, the whole nature of the civil liberties debate will change overnight, as we all know.

It is indicative also that we have an anti-terrorism bill that passed the Senate. We worked out our concerns very carefully and, I think, drew a pretty careful balance about what the military could do and when it could operate after the Attorney General, after the Secretary of Defense. That bill is stuck in the House. But if we had one chemical attack, what the militia is now saying—some of the militia—about ceding of authority to the military would disappear overnight. Within 2 days that bill giving authority to the U.S. military to come in in emergency situations would pass. Now, we don't want to give too much authority to the United States military, but we are woefully ill prepared now in our law enforcement community to deal with these kinds of attacks.

So under very careful circumstances, we have to have the ability of our military to go in when there is this kind of attack with their equipment, their special technologies, and assist law enforcement, not take over but assist.

But I think the question of what we do in terms of this balance will determine an awful lot, but I think it is imperative we get out in front of the situation and strike the right balance rather than waiting for it to happen and then greatly overreact at the expense of our constitutional protections. So that is what this hearing is all about.

I might also say, Senator Cohen, I share your view that we have major challenges in verification and implementation of either chemical and certainly the biological which has been on the books now since 1972. Those are going to be continuing. We will have testimony, I think, as we go through this hearing today and tomorrow that will indicate that all of those implementation and verification problems will be easier with the treaties than without them, and that those are major challenges, as Senator Lugar well knows, that exist now. And the absence of the treaties doesn't in any way facilitate either verification or implementation whereby the actual ratification of those will make what is, by definition, an almost impossible job more achievable than is the present case.

In my view, this set of hearings and those that Senator Lugar has conducted already and those that he will conduct and those that you and I have worked together on in the past, Senator Cohen, indicate the national security area and arena that we are going to be dealing with for the next 10 to 20 years. This is the number one challenge. It is not Russia invading Poland or Czechoslovakia. It is the question of what comes out of the former Soviet Union in terms of military threat that could be spread all over the world. That is the challenge that we face at this point.

Senator COHEN. Could I add just one footnote to all of this? We keep reading in our press about whether or not we have enough of a mission for the Central Intelligence Agency and whether or not it ought to engage in economic espionage. There is plenty for our intelligence agencies to do. With regard to the notion that we are now living in a more peaceful world, I think Senator Nunn has clearly pointed out that while there is less of a nuclear threat to the United States, but the nature of the threat has changed dramatically, and it is even more dangerous in many other respects.

We have quite a mission for the CIA and all of our intelligence community to perform.

Senator NUNN. Senator Lugar?

Senator LUGAR. I had just one question. You have testified—and I thought that it was a very important point—that the Aum group was really not on the radar screens of our intelligence and defense officials, until the Tokyo attack, despite the loss of life and other activities earlier on.

Having visited with Japanese authorities, what was their perception of Aum? Did they appreciate that the intent of the organization was the overthrow of the Japanese Government?

Mr. SOPKO. Senatór, I don't believe they fully appreciated it either. They knew about it. They had concerns about this group as it got more violent. But as you will probably hear from some of the other witnesses, they were reluctant to move for the same reason that we may be reluctant to move against a religious organization that is protected by statute.

I assume they were hoping it would just go away, we were told. It didn't. They had an indication that the Aum was starting to develop some type of chemical capability. I don't believe from our interviews that they knew how far it had gone until the sarin was released in Matsumoto and then in Tokyo. They probably had no indication at all or very little inkling about the biological capability, and only once they went into the site and actually opened the doors to one of the buildings and then quickly shut it did they discover that there was a major bio lab and major bio research facility there.

I think that probably summarizes it. They knew something was going on, but they didn't fully appreciate it. And I don't believe they fully appreciated the international scope of this organization.

Senator LUGAR. Prior to the Matsumoto incident or the Tokyo attack, was there evidence of cooperation between intelligence authorities in any of the other countries you have referenced, for instance, from Russia, from Australia, from the United States? In other words, did the Japanese, in trying to evaluate their predicament, have any assistance from other nations?

Mr. SOPKO. Senator, there was very little discussion back and forth, I think, between the various countries on this group. Japan knew there was a problem there, viewed it wholly as domestic.

Now, at one point, as you may have heard when Mr. Edelman was speaking, the Australians became concerned about who this fellow Asahara was and why was he in Australia with all this excess baggage. They did contact the Japanese—now, this would have been pre-Matsumoto, pre-Tokyo. They did contact the Japanese authorities and got background on who Asahara was and some of the other people.

To that extent, that was all of the international cooperation we saw. As far as we know, neither the Japanese contacted the Russians nor the Russians contacted the Japanese or any—the U.S. or whatever, prior to the Tokyo incident about this group.

Mr. EDELMAN. Just to add, the contact between the Australians and the Japanese was more on the lines of police-to-police or police-to-immigration authority contacts and did not appear to be of an intelligence nature.

Senator LUGAR. If the United States were facing a similar predicament and we were receiving similar amounts of information from

Australian police and export control authorities, to what extent would this register on our radar screen? In other words, when would it finally reach a point where the President of the United States, the CIA or the Secretary of Defense would recognize that there was a threat out there? If it didn't reach our radar screens until Tokyo, obviously either the Japanese didn't tell us or we didn't get the message in an appropriate form.

Mr. SOPKO. In this type of setting, Senator, that would probably be a useful question to ask, and that is the appearance we have.

One of the things that is crucial is basically the analysis, getting the information to some group or organization that can analyze it, and it has got to be an all-sources center. Somewhere in our government or internationally somebody should be collecting, whether it is law enforcement, whether it is intelligence, whether it is public record information—which, surprisingly, in the course of our investigation we have been getting better information, better sources in many areas from just public sources, you know, the academics or the institutions out there.

But only when all of that information comes in somewhere and somebody can then see a connection between an organized crime case in Tokyo and a murder in Russia or the movement of—or customs documents that showed a movement of some sarin by-product will they understand what the significance of it is. And that is why when we are talking about greater cooperation, it has got to be not just among law enforcement but law enforcement with the intelligence community and it has got to be international in scope.

Senator LUGAR. One of the points of this hearing is to serve as a data base for all we have collected to date on the subject, as well as to try to think through some institutional means of translating the work of the hearing into policy. The witnesses we have heard have done this collection from all sources, and by their analysis we finally begin to see a pattern. But I don't believe this has been occurring regularly, and this reinforces the utility of these hearings.

Senator NUNN. Thank you, Senator Lugar.

I believe we have about a 2-minute wind-up here with the Australian video relating to both the uranium mining and the sheep gassing. It will take about 2 minutes, if you all could play that, and then we will call our next panel.

Alan, if you could tell us what is going on, I believe there is no sound, it is just video.

Mr. EDELMAN. This is Mr. Hayakawa, the Construction Minister. He was one of the first to come to Australia with Mr. Inoue, who is their intelligence and action squad director. This is the actual Banjawarn Station property. You can see it is in a very remote area.

This is the Australian real estate agent they utilized to purchase the property, which is in Western Australia in the Outback.

Subsequently, Mr. Hayakawa came back with Mr. Maki, who is pictured here, and they stayed on the property.

These are some of the buildings on the property. You can see one was labeled as a laboratory. This is the inside of that laboratory. You can see there how remote the area of Australia was where they were present. They had to use 4-wheel-drive vehicles to get around. No neighbors around basically for miles and miles.

This is some of the excavation that the Aum members were doing on that property, and many believe it was a search for uranium deposits. These are some of the other buildings on the property.

After the Tokyo attack, the Australian authorities were alerted by the new owners of the property. They sent a team out to Banjawarn Station where they inspected the property, took samples of the soil. They also found on the property the pile of sheep carcasses. They as well found chemicals, equipment, evidence of digging. That is the pile of the sheep carcasses. Not a very pleasant sight. But they took samples from that which were then analyzed at Australian Federal laboratories, and the result of that analysis was they determined that there was a presence of sarin there.

Senator NUNN. OK. Thank you both, and all the staff from both the majority and minority who were working on this. You have done an excellent job.

[The prepared statement of the staff follows:]

STAFF STATEMENT

GLOBAL PROLIFERATION OF WEAPONS OF MASS DESTRUCTION: A CASE STUDY ON THE AUM SHINRIKYO

I. INTRODUCTION

Mr. Chairman and Members of the Subcommittee, this week the Subcommittee begins the first in a series of hearings concerning the global proliferation of weapons of mass destruction: Chemical, biological and nuclear. These weapons may be the most serious threat to our Nation's national security in light of growing evidence that some terrorist groups and rogue states have already acquired and others are actively seeking such weapons for their arsenals.

Six years ago, in 1989, this Subcommittee, in conjunction with the Committee on Government Affairs, held four days of hearings on the spread of chemical and biological weapons. The hearings were, to a great extent, spurred by revelations from the battle fields of the Middle East where both the Iranians and Iraqis used chemical weapons. At those hearings we learned not only of the devastating effects of these weapons, but also of the rapid rate at which these weapons have begun to proliferate throughout the world.

At those hearings, the specter of terrorist groups using chemical or biological weapons was only hypothetical. Although there had been sporadic reporting of such groups showing some interest in these devices, up to that time there had been no credible evidence of a terrorist group actually deploying such weapons. Additionally, at the time of our 1989 hearings, the idea of a major terrorist attack occurring in the United States was also more hypothetical than real. Combined efforts of our Nation's intelligence and law enforcement communities had thwarted such groups from attempting what was then viewed as the "unthinkable."

Unfortunately, much has changed since 1989. As we all know from recent events in the United States, the destructive intentions of fanatical individuals and groups has become an actuality in Oklahoma and New York City. Reports from Eastern Europe document police seizures of kilogram quantities of weapons grade uranium. And just seven months ago, on March 20th, we witnessed the first major use of chemical weapons by terrorists with the gassing attack of the Tokyo subway system which killed 12 and injured over 5,000 innocent passengers.

Commentators throughout the world now agree that these events are of major international significance. The proverbial genie has been released from its bottle. In a quantum leap, terrorists responsible for the American and Japanese events have planted ideas and provided roadmaps for others to attack American domestic targets as well as to use such weapons against innocent civilian populations worldwide. As Bruce Hoffman of the Center for the Study of Terrorism and Political Violence at St. Andrews University in Scotland recently stated:

> "We've definitely crossed a threshold. This is the cutting edge of high-tech terrorism for the year 2000 and beyond. It's the nightmare scenario that people have quietly talked about for years coming true."

It is in this context that Senator Nunn last year directed the Minority Staff of the Permanent Subcommittee on Investigations to initiate an investigation into the proliferation of weapons of mass destruction including chemical, biological, and nuclear. His request was a natural progression from the work done by the Staff in 1994 relating to the meteoric growth of organized criminal activity in the former Soviet Union. That inquiry raised the specter of criminal involvement in the theft and distribution of fissile material from the Former Soviet Union. It culminated in the first congressional hearing that brought together the heads of law enforcement agencies combating organized crime in Russia, Germany, and the United States to testify about their common problems and concerns. (See: *International Organized Crime And Its Impact On the United States*, May 25, 1994, S. Hrg. 103–899).

The Staff initially began its investigation by focusing on the possibility of diversion of nuclear materials from the Former Soviet Union. A hearing on issues related to this problem is planned for later in the year. However, recent events from Japan overtook the investigation and, last June, Senator Nunn redirected the Staff to focus upon the ongoing activities of the Aum Shinrikyo as a case study of what can happen when a fanatical group with financial resources obtains sophisticated technical abilities and decides to utilize weapons of mass destruction in furthering its goals.

In the course of the last five months, the Minority Staff conducted hundreds of interviews of both government and private individuals. The Staff received both classified and unclassified briefings from almost every major United States law enforcement and intelligence agency as well as many elements of our military and civilian agencies. The Staff was also briefed by numerous foreign agencies including officials of the Japanese, German, Russian, Ukrainian and Australian governments. In addition, two months ago, the Staff traveled to Japan, Russia, Ukraine and Germany to obtain first hand information concerning the activities of the Aum cult. In the United States, the Staff conducted numerous interviews in New York and other regions, reviewed subpoenaed records from the cult's New York office, and examined documents from corporations which had business relations with the cult or its corporate entities.

The Minority Staff investigation was greatly assisted by Senator Roth and Stephen Levin, Michael Bopp and Ian Brzezinski of his staff. In addition, the Subcommittee Staff appreciates the cooperation and assistance provided by the various agencies of the United States and foreign governments contacted in the course of this inquiry. The Staff would like to especially acknowledge the assistance of the United States Customs Service and Central Intelligence Agency for providing detailees to the Subcommittee to assist in this complicated investigation.

II: PRELIMINARY FINDINGS AND QUESTIONS

The Staff's investigation of the activities of the Aum Shinrikyo found evidence to suggest that the Aum cult was a clear danger to not only the Japanese government but also to the security interests of the United States and that this danger, although lessened significantly by the actions of Japanese authorities, is still present.

Although the findings may initially sound farfetched and nearly science fictional, the actions of the Aum and the facts corroborated from multiple sources by the Staff create a terrifying picture of a deadly mixture of the religious zealotry of groups such as the Branch Davidians, the anti-government agenda of the U.S. militia movements and the technical know-how of a Doctor Strangelove. The Staff found that:

- The cult was extremely large with approximately 40,000 to 60,000 members worldwide including a membership estimated to be three times larger in Russia than in Japan.
- The cult was extremely wealthy with more than $1 billion in assets.
- The cult actively recruited scientists and technical experts in Japan, Russia and elsewhere in order to develop weapons of mass destruction.
- The cult was planning and apparently had the means to directly assault the leadership of the government of Japan.
- The cult had produced chemical weapons, including toxic chemical agents such as Sarin, VX, phosgene and sodium cyanide and had successfully deployed sarin on at least two occasions against large groups of innocent civilians.
- The cult was also in the process of developing biological weapons, including anthrax, botulism and "Q" fever and may have actually attempted at least one unsuccessful deployment of a biological weapon on the innocent populace of Tokyo.
- The cult attempted to assassinate the chief law enforcement officer for Japan as well as the Governor for the prefecture of Tokyo.
- The cult had successfully infiltrated various levels of the Japanese government and industry including elements of its law enforcement and military.
- The cult regularly used murder and kidnapping to silence its enemies in Japan.

- The cult acquired conventional armaments and attempted to acquire weapons of mass destruction and their technologies from the former Soviet Union to utilize in their planned attack on the Japanese and United States governments.
- The cult was also actively engaged in acquiring sensitive technologies in the United States to also assist it in weaponization—the full extent of which is still not fully known.
- The cult leadership was ruthless, cunning and fully willing to utilize any and all means, including the killing of hundreds of thousands of innocent citizens, to carry out its avowed purpose of plunging the United States and Japan into a war of "Armageddon" from which the cult would arise as the supreme power in Japan.
- The activities of the cult were and continue to be of a security concern to the Secret Service for the protection of the President of the United States.
- This cult, its activities, and intentions were not fully appreciated by United States law enforcement and intelligence services until after the Tokyo gassing incident on March 20, 1995. As one senior U.S. law enforcement official stated—"they weren't on our radar screen."

In a large sense, the Aum incident is a remarkable yet frightening case study of the threat modern terrorism poses to all industrialized nations. It raises a series of difficult questions about domestic and international preparedness as we enter the next millennium. It serves as a harsh wake-up call for the United States which until recently was rather complacent about the threat of terrorism. Some of the issues these hearings are meant to raise include:

- How was this Doomsday Cult able to recruit some of the best and brightest of university trained scientists in Japan and elsewhere and what are the implications for other Western industrialized nations?
- How could a purported pacifist religious group accumulate such technology and weaponry in a relatively short period of time without raising the attention of Western intelligence and law enforcement agencies?
- Was this cult linked to or supported by other groups, whether political, criminal or intelligence?
- What did U.S. law enforcement and intelligence agencies know about the capabilities and intentions of this group before the Tokyo incident?
- Could such an event happen here?
- If so, are we prepared for such an occurrence from an intelligence, law enforcement and public health perspective?

In an attempt to answer these questions, the Staff has prepared the following summary of the Aum's activities. Much is still not known about all of their interests, especially here in the United States and in Russia. Most of the trials in Japan have not been completed and the evidence presented in those trials has not been widely disseminated outside of Japan. To the Staff's knowledge, none of the defendants have been debriefed by U.S. officials. Despite this, much can be learned from what the Staff was able to uncover in its inquiry.

Unless otherwise noted, the Staff has corroborated the following account with multiple foreign and domestic sources including government agencies, current and former cult members, outside experts and subpoenaed documents. In many instances the Staff has obtained first hand accounts and original documentary evidence from government and private sources. Due to the sensitivity and uniqueness of some of the material obtained by the Staff, we have withheld or otherwise concealed the sources of some of the material. Those documents used by the Staff which are especially sensitive have been maintained as sealed exhibits of the Subcommittee and are available for the Members and their staff to review.

III. BACKGROUND OF THE CULT

A. The Early Years

1. *The Master Asahara: Humble Beginnings*

The Aum Shinrikyo (Supreme Truth) was founded in 1987 by Shoko Asahara, a 40-year old legally blind former yoga teacher. Asahara was born on March 2, 1955 as Chizuo Matsumoto in Yatsushiro, Japan. He was the fourth son of seven children—five boys and two girls. His family was poor, his father being a tatami (mat) maker. He was educated in local schools for the blind because of infantile glaucoma. He left home at the age of six and lived in a school dormitory from then until graduating from high school. After graduating from the Kumamoto Prefectural School for the Blind, Asahara moved to Tokyo where he unsuccessfully sought enrollment in Tokyo University. He apparently graduated from a junior college in March 1975, and later received some informal training as an acupuncturist.

Little more is known of his early years. He apparently married a local college student in 1977 and has six children with his wife, Kazuko. Although his followers claim that before founding his cult he traveled widely in the East in the pursuit of religious training, the Staff was unable to confirm this. The Staff did corroborate that Asahara apparently worked in acupuncture for some time and also operated a pharmacy in the late 1970's and early 1980's. Police reports indicate he was arrested on suspicion of violating Japanese pharmaceutical laws in 1982 for selling unregulated medicines. The Staff was unable to determine the disposition of this arrest but was advised that he was never jailed for the offense. However, as a result, his pharmacy went into bankruptcy shortly after his arrest.

In 1977 Asahara began the study of yoga and in 1984 he formed a company called the Aum Shinsen-no kai which was a yoga school and publishing house. From various Aum publications it appears that around 1986 he changed his own name to Shoko Asahara and, in 1987, the name of his yoga group to the Aum Shinrikyo—a Sanscrit derivative literally meaning "teaching the universal or supreme truth."

2. *Religious Recognition: A Turning Point*

In August, 1989, the Tokyo Metropolitan Government granted the Aum official religious corporation status. This law provided the Aum various privileges including massive tax breaks and de facto immunity from official oversight and prosecution. The Staff was repeatedly told that this was a significant event in the development of the Aum's deadly activities. Under the Japanese *Religious Corporation Law*, after a group is recognized, authorities are not permitted to investigate its "religious activities or doctrine." This is broadly interpreted to cover almost everything the religious group does, including what would normally be viewed as "for profit" corporate activities. Although the police could investigate a religious group for criminal acts, the Staff was told by Japanese cult experts and government officials that in practice this would be difficult if not impossible to do because of the law and the government's reluctance to investigate religions.

Ironically, the United States is partially responsible for the broad interpretation given to the *Religious Corporation Law*. The law was enacted in 1947 as a reaction to excesses against religious groups by the former Japanese Imperial government. With strong American influence in post-war Japan, this law was enacted to protect religious beliefs from government interference. Since its enactment approximately 200,000 religious groups have been recognized. Their membership actually exceeds the population of Japan by almost 70 million due to multiple memberships. Although the vast majority of these religious sects are law abiding and well respected, the Staff was told that there is effectively no government oversight over the activities of any of these groups even though some operate tax exempt "for profit" businesses and a few control their own political parties.

The Staff learned the Aum made their recognition as a religious group a high priority. They embarked upon an aggressive lobbying campaign which included picketing the offices of the agency that was to make the decision. One Aum expert who had been following their activities for some time called their efforts "scandalous" and totally out of character with other religious groups. Public sources have alleged that to ensure their registration, the Aum also aggressively lobbied local politicians to put pressure on the Tokyo government officials to approve their application.

The Staff was told that this quirk in Japanese law was a significant factor in the development of the Aum cult. With its registration as a legally recognized religion, the Aum's activities and character dramatically changed. Its net worth grew from less than 430 million yen (approximately $4.3 million) when recognized in 1989 to more than 100 billion yen ($1 billion) by the time of the Tokyo incident six years later. Likewise, its membership rose dramatically after legalization. From merely a score of members in 1984 it grew, by its own accounts, to 10,000 members in 1992 and about 50,000 worldwide in 1995. And, from one office in Japan in 1984 it expanded to over 30 branches in over six countries.

Starting in 1989 the cult also became more aggressive and dangerous. With its dramatic growth, the Staff found evidence of increased complaints from parents and family members of Aum recruits alleging kidnappings and other physical assaults by the cult. A number of anti-Aum groups were started at about this time by family members of cultists.

Those that formed these groups complained that they themselves became victims of assaults and harassment. For example, as we will describe in a later section, the first Aum murders occurred within months of the sect being granted religious status when in November of 1989 cult members kidnaped and murdered a prominent Yokohama lawyer, Tsutsumi Sakamoto, his wife and their one year old son. Prior to his disappearance, Mr. Sakamoto had represented many of these anti-Aum groups.

The Staff was told that with their protective religious status in place, the cult felt so confident that they were immune from government interference that they decided to silence Sakamoto. After successfully doing so, the lack of any government response, we were told, apparently emboldened the Cult to commit even more horrible and blatant attacks upon their perceived enemies in Japan. As we now know, this "immunity" did not last. Since the Tokyo incident, the Japanese police have arrested about 400 Aum members, including most of their hierarchy.

3. *Political Failure: Another Turning Point*

Another event that the Staff learned was important in the changing aspect of the Aum cult concerned their brief foray into politics. The year after they became a registered religion, Asahara announced to his members that the Aum was going to run a slate of candidates in the Japanese Diet election in February 1990. Asahara and 24 other members of his inner circle ran for parliament under the banner of the Aum's own party—the Shinrito.

The Staff was told by former Aum members that Asahara was personally very confident that both he and the other Shinrito candidates would win their elections. However, all lost badly. Asahara himself only received a mere 1,700 votes out of approximately 500,000 votes cast. To add to his humiliation, former Aum members told the Staff that Asahara did not even get all the votes of his own followers who numbered well in excess of the 1,500 votes he obtained.

It is almost universally held that the 1990 election defeat was the final turning point for the direction the Aum would eventually take. Although they had already committed crimes, including murder before the 1990 election, after their defeat the Aum gave up on all legal pretensions and turned away from normal interaction with the larger Japanese society. From then on the rhetoric of Armageddon and paranoia became incessant. Cult experts in Japan told the Staff that in hindsight it appears that from 1990 onward, the die apparently was cast for a violent confrontation with the people and government of Japan.

B. The Cult's Beliefs

1. *East Meets West: A Levitating Terrorist*

The Aum Shinrikyo is grounded in Buddhism but with a strong mixture of assorted Eastern and Western mystic beliefs including the works of the 16th Century French astronomer, Nostradamus. The religion preaches that there are a number of steps or levels of consciousness that a member can reach through the teachings of "the Spirit of Truth, His Holiness the Master Shoko Asahara." Aum literature claims that only one person, Shoko Asahara, has attained the highest level of consciousness and exists in the state of Nirvana. The Staff interviewed one former member of the Aum who had been recruited because of his knowledge of the religious teachings of Buddha. He told the Staff that for a period he was tasked with writing all of the "divine teachings" of Shoko Asahara who, in his opinion, knew very little about Buddhism in his own right.

The Aum faith also included a number of religious views surrounding "reincarnation" as well as Tibetan beliefs in extrasensory experiences including clairvoyance, "seeing through walls" and "levitation." Asahara claimed to frequently levitate and fly around rooms. The only photographic evidence the Staff reviewed concerning these flights appeared to be crude forgeries. Even to the untrained eye they show that rather than levitating, Asahara was probably bouncing on a device such as a trampoline to become airborne.

2. *Aum Armageddon: Shiva Meets Sarin*

The Staff was also told by authorities that the cult was fixated with the Hindu god "Shiva." This was significant since "Shiva" is the "god of destruction" thereby explaining in part the violent nature of the cult and its particular emphasis on "Armageddon." Although this concept is widely known in Western religions, "Armageddon" or the "end of the world" is not a normal tenet of Buddhism or other Eastern religions popular in Japan. However, it was a core element of the Aum religion with salvation only coming at the end of Armageddon to those who adopted the Aum faith. Asahara foretold salvation for those Aum members who have attained a higher state through the teachings of the "Supreme Master"—Asahara. Asahara also preached salvation even to those of his members who perished in the predicted Armageddon since they were assured a special status in their reincarnated state.

The Staff was told by Japanese government officials that in 1989 Asahara published a major religious treatise on Armageddon called *The Destruction of the World.* In it Asahara apparently described a world-wide calamity based upon a purported war between Japan and the United States which would start sometime in 1997. Asahara based his predictions on "The Prophecies of Nostradamus," the "Revelations of St. John" from the New Testament, Buddhist scriptures, and other personal revelations.

Again in 1993, Asahara publicly reiterated his predictions of Armageddon. In a book entitled *Shivering Predictions by Shoko Asahara*, Asahara stated that:

> "From now until the year 2000, a series of violent phenomena filled with fear that are too difficult to describe will occur. Japan will turn into waste land as a result of a nuclear weapons' attack. This will occur from 1996 through January 1998. An alliance centering on the United States will attack Japan. In large cities in Japan, only one-tenth of the population will be able to survive. Nine out of ten people will die."

Later that year in another book published by the Aum in July, entitled *Second Set of Predictions by Shoko Asahara*, he provided further revelations concerning these wars. He claimed that a Third World War would soon break out. He wrote that :

> "I am certain that in 1997, Armageddon will break out. By 'break out' I mean that war will erupt and that it will not end soon. Violent battles will continue for a couple of years. During that time, the world population will shrink markedly. . . .
>
> "A Third World War will break out. I stake my religious future on this prediction. I am sure it will occur."

Within days after the subway attack in March 1995, Asahara, in a video message wherein he denied complicity in the incident, further explained the perceived role of his cult in Armageddon:

> "We act on the basis of prophecies. In 1997 and 1998 most of Japan's large cities will suffer major damage in a war between the U. S. and Japan. Then the Japanese economy will collapse. Japanese assets will be lost, reviving the nation after this collapse is one goal of ours . . . salvation activities."

3. *Armageddon in 1995: A Threat to the United States?*

Although most of Asahara's prophecies predicted the Armageddon in 1997 or 1998, documents recently seized by the Japanese police from Aum facilities indicate that sometime starting in 1994 the date for this cataclysmic event was moved up to November of 1995. The Staff was told by Japanese government sources that they were concerned from analyzing cult teachings that the Aum may have "decided to speed things up" by instigating the predicted war between Japan and the United States in November, 1995.

The new November timetable for Armageddon appears to have coincided with public statements by Asahara that he and his people were already the victims of gas attacks by Japanese and U.S. military aircraft. In a public sermon delivered by Asahara at his Tokyo headquarters on April 27, 1994, he claimed that:

> "With the poison gas attacks that have continued since 1988, we are sprayed by helicopters and other aircraft wherever we go. . . . The use of poison gases such as *sarin* were clearly indicated. The hour of my death has been foretold. The gas phenomenon has already happened. Perhaps the nuclear bomb will come next." (Emphasis Added)

The date of this speech is significant since it predates by two months the June 27th sarin gas attack in Matsumoto, Japan. This event, which left 7 dead and over 500 injured will be discussed in greater detail later in the Staff statement. Although the Aum has always publicly denied any involvement in any gas attacks, evidence developed after the Tokyo incident from arrested cult members clearly implicates the cult in the Matsumoto incident. Juxtaposed, the prediction of the new Armageddon in November with the discussion of sarin, leaves a clear impression that the Aum may have been planning a gas attack in November 1995.

The November prediction is troubling as it coincides with the fact that President Clinton and 17 other world leaders are scheduled to gather in Osaka, Japan for the annual Asia-Pacific Economic Cooperation (APEC) meeting on November 16–19. The Staff has not discovered a link between these two events. We have no credible evidence that the Aum planned an attack directed at the APEC gathering. The timing of the two events, however, raises some concern.

Just two weeks ago, the Japanese press reported that the Japanese police have launched one of their nation's largest security details to protect the November 16–19 Asia-Pacific conference. The articles specifically note that the police are guarding against a possible nerve gas attack similar to the sarin attack in Tokyo. They claim that the Osaka police have stocked up on gas masks and chemical protection suits in order to guard against any such attack. Takaji Kunimatsu, the Commissioner General of the Japanese National Police Agency, is also quoted as ordering all of his police commanders to be on "full alert', saying:

> "Particularly after the subway incident, it has become extremely difficult to predict who would do what. . . ."

Kunimatsu is also said to have called on all senior police chiefs to step up their investigations of the Aum sect since "the truth of the sect remains unclear."

Concern that the Aum may have sought out United States targets is fueled by the rampant anti-American rhetoric historically used by the cult. As early as 1993, Asahara accused the United States of planning the attack on Japan that would foreshadow the Armageddon. The cult's literature also disparaged the United States, blaming the West for causing the rampant materialism and internationalism that the cult claims is at the root of the current problems with Japan. The cult has repeatedly accused the United States of masterminding and of carrying out a series of chemical attacks on it. These accusations go back to early 1994 and the cult produced a 1994 video tape entitled *Slaughtered Lambs* that allegedly documents these attacks.

The anti-American rhetoric became more personalized in January, 1995 when the cult's monthly organ, *Vajrayana Sacca* printed a series of anti-American and anti-Japanese government articles. The Staff obtained one article called *Will Clinton Be Assassinated?* In which the cult wrote:

> "Clinton will be without doubt a one-term president. At best, he will not be re-elected. At worse, it would not be strange if he were assassinated, making it appear like an accident."

That same publication also contains an article raising the specter of planned terrorist assassinations of various Japanese officials. A number of prominent Japanese officials were listed as "blackhearted aristocrats who had sold their souls to the devil." Included were Daisaku Ikeda, the Honorary Chairman of Sokagakkai, a Japanese religious group; Yukio Aoshima, the Governor of Tokyo; and Ichiro Ozawa, the Secretary General of the New Frontier Party of Japan. Ozawa, was especially singled out and placed at the head of the list as "the king of darkness" for his close ties with the United States. The Staff was told by a number of Japanese sources that President Clinton was also named on another similar list prepared by the cult; but to date we have not been able to find this document and list.

Some credence can be given to this being a list of potential assassination targets. On May 16, 1995, on the evening of Asahara's arrest, Tokyo Governor Aoshima, who was prominently mentioned on the January list, was the recipient of a mail bomb. Although he was not injured, his secretary lost a number of fingers when the bomb detonated outside the Governor's office.

Unconfirmed press reports assert that the cult was targeting the United States. Japanese Public Television (NHK) issued a story in mid-June, 1995, that it had obtained portions of the confession of the cult's chief physician, Ikuo Hayashi, in which he admitted the cult was planning, as early as November of 1994, to mail packages of sarin to unnamed locations in the United States. It quoted Hayashi as saying that the Intelligence Chief of the cult, Yoshihiro Inoue, wanted Hayashi to travel to the United States to receive the parcels for further delivery. The broadcast indicated that the plan was never carried out but that Inoue still planned to use sarin gas in America. Both Hayashi and Inoue have been charged along with others for murder for the March 20th Tokyo subway attack.

The Staff learned that the cult's Intelligence Ministry Chief Inoue kept a number of detailed diaries or notebooks in which he jotted down random thoughts and plans concerning the Aum. These notes were seized by the police. Allegedly, Inoue wrote down a plan to carry out some kind of indiscriminate terrorism in major U.S. cities, including New York. The terrorist attacks were to be similar to the Tokyo sarin gassing. Although some portions of these notes have been corroborated, those specific sections describing the New York attack have to date not been confirmed. Although the Japanese media claim that the police have possession of these sections that describe the New York plot, the Staff, to date, has been unable to obtain access to them.

It is a vexing task to quantify the level of threat a group such as the Aum presents to U.S. security. As this report indicates, the Aum was highly dangerous and extensively erratic and unpredictable, obtaining much of their direction from the "prophecies" and rambling of a charismatic madman. However, it is clear that a core belief of the Aum was that the United States was an enemy of the Aum and that a war with the United States was a central component of their prediction of Armageddon. Although no specific threat against President Clinton has been documented, the Staff has learned that both the United States Secret Service and the Japanese government take such a threat seriously and have taken security precautions.

4. *Aum's Other Enemy: The Jews*

The Aum was also virulently anti-Semitic. As an example, in a 95-page publication issued two months before the Tokyo incident, the Aum attacked the Jews as the "hidden enemy." This special edition of the *Vajrayana Sacca* was entitled *Manual of Fear* and began with a declaration of war on the Jewish people:

> "On behalf of the earth's 5.5 billion people, *Vajrayana Sacca* hereby formally declares war on the 'world shadow government' that murders untold numbers of people and, while hiding behind sonorous phrases and high sounding principles, plans to brainwash and control the rest. Japanese awake! The enemy's plot has long since torn our lives to shreds."

The tract quotes liberally from a number of anti-Semitic writings and blames the Jewish people, for among other things, the mass murders in Cambodia by the Khmer Rouge, the massacres by Serbs and Croatians in Bosnia, and the tribal warfare in Rwanda. It claims that the Jews are planning similar massacres in other areas of the world in order to carry out a sinister plot to reduce the world's population by three billion people by the year 2,000. The Aum also has linked the Jews to its other enemies within Japanese society—the "black aristocracy" of Japanese "internationalists" including a number of current and former Japanese politicians and statesmen.

Although the Staff found no evidence of specific attacks upon Jews or Jewish cultural, religious, business or political institutions, this may have been more the simple result of the absence of such targets in Japan. On the other hand, the Aum did target for its rhetoric those it called "Jewish Japanese." These people were not Jewish but rather cosmopolitan Japanese, government officials and members of the business establishment in Tokyo who in the Aum's view exemplified the internationalism and materialism that the Aum hated. Eventually, these "Jewish Japanese" became the victims of the Aum's indiscriminate Matsumoto and Tokyo sarin attacks.

IV. THE OPERATION OF THE AUM

A. Membership and Recruitment: Large and Highly Technical

The cult claimed a membership as high as 65,000, the large majority of whom, 30,000–50,000, were in Russia. These numbers have not been publicly corroborated by the Japanese government although most of the officials and Aum experts the Staff interviewed placed the worldwide membership in the 40,000 to 60,000 range. Despite the recent spate of publicity surrounding the criminal acts of the cult and the arrest of approximately 400 Aum activists by Japanese authorities, there has not been a dramatic loss in membership in Japan. Since declared illegal by Russian authorities, Aum membership in Russia has declined drastically. The Staff has prepared a list of the most important cult members, attached as Appendix A.

In the course of our inquiry, it became clear that the Aum included among its followers many highly-trained graduates in the sciences and technological fields from some of Japan's leading universities. They included members with degrees in fields such as medicine, biochemistry, architecture, biology, and genetic engineering. A distinctive feature of this cult was that many were young intellectuals in their 20's and 30's who had dropped out of Japanese society to join this doomsday cult.

Among some of Japan's "best and brightest" who joined the cult included a former researcher of the National Space Development Agency of Japan, an expert on chemical weapons who majored in organic physics at Tsukuba University, a researcher who studied elementary particles, a reporter with a major Japanese newspaper, a physicist from Osaka University, a cardiac specialist, and an organic chemist, to name a few.

The Japan Times recently released a detailed description of a number of the key members of the Aum hierarchy which offers an excellent view of the expertise of this cult. It reported the following:

> *Hideo Murai*, (36) (deceased)—Minister of Science and Technology—After graduating from the physics department of Osaka University he entered graduate school specializing in physics and started working for Kobe Steel Ltd's research and development department.
>
> *Kiyohide Hayakawa* (45)—Minister of Construction—Held a master's degree in architecture from Osaka University.

Fumihiro Joyu (32)—Public Relations Minister—Graduate of Waseda University with a masters degree in artificial intelligence. Was an engineer at the National Space Development Agency before joining cult.

Yoshinobu Aoyama (35)—Justice Minister—Son of a wealthy family in Osaka. Graduate of Kyoto University Law School and youngest person to pass national bar exam.

Masami Tsuchiya (30)—Chief Scientist—Held a master's degree in organic chemistry from Tskuba University. Reportedly joined the cult because it had better research facilities than his university.

Not all of the Aum members had such backgrounds. A number of the members were poorly educated and from working backgrounds. Many were young and rebellious. The Staff was told by two former cult members that these working class members had been specifically recruited for work details to help in the construction of the various Aum factories and also for the Aum's military forces. Nevertheless, the Staff discovered that the vast majority of the Aum's recruits had college or university backgrounds.

It is difficult to understand the Aum's attraction to such an educated audience. This is still the subject of much debate in Japan and has been the subject of numerous articles and editorials in the Japanese media.

Regardless of the reasons for their success, the Aum was extremely successful in its recruitment drives. They were very aggressive in their recruitment activities and even had an entire division called the New Followers Agency to perform this task. Beyond rudimentary techniques such as leafleting and street corner proselytizing, the Aum used a diverse blend of recruiting methods. They used their classes on yoga, herbal healing and meditation on campuses to recruit. They also recruited through their numerous computer stores, book stores and noodle shops. Additionally, they broadcast their message to Japan through their Russian radio station and used it and other radio and television shows in Moscow to recruit in Russia.

A number of Aum experts contacted by the Staff, contend that the Aum was successful not only for all of the above reasons but also because of their use of psychedelic and mind-altering drugs in the recruitment process. The Staff found strong evidence to support the contention that the Aum used these substances along with other brainwashing techniques including sleep deprivation and isolation therapy. Many ex-Aum members have been quoted publicly admitting to the use of these tactics.

Perhaps the most compelling evidence of the strength of their recruitment efforts is that at the time of the Staff visit to Japan, five months after the Tokyo subway attack and subsequent to the arrest of most of the Aum leadership, the Aum was still successfully recruiting new followers. In fact, Fumihiro Joyu, who replaced Asahara as spokesperson for the Aum, became a "teen idol" for thousands of Japanese adolescent girls who fancied his looks. All of this occurred despite the fact that literally hundreds of Aum members had been implicated in murder, attempted murder and kidnapping plots.

Beyond generalized recruitment, they also appeared to have targeted specific individuals with unique skills for recruitment. The Staff confirmed that they recruited from the military, the police and certain key technological industries and faculties to further their militarization and intelligence functions.

For example, the Staff learned that the Aum had a strategy to recruit officers of the Japanese Self Defense Force (JDF) to use them as "combat troops" for the cult as well as to assist them in training other Aum members and in providing intelligence on government activities. Shockingly, the Aum appeared to have been successful in these efforts.

For example, based on this strategy, the Aum obtained the lists of hundreds of JDF members and tried to recruit them. The list was recovered during the arrest of an Aum follower. This strategy placed a high priority on recruiting members of the First Airborne Brigade and other highly trained divisions. The Staff discovered evidence that to carry out this recruitment drive the Aum even wiretapped the house of the First Airborne Brigade's commander to spy on his private life.

Former cult members interviewed by the Staff confirmed this recruitment drive and said that there were approximately 100 Defense Force members recruited, including 60 former members. The JDF has publicly admitted that only 20 incumbent and former JDF members were also Aum members although there appears to be evidence that the number was somewhat higher.

The Staff also learned that a number of the former or current JDF officers who were recruited by the Aum provided critical assistance to their new religion. For example, we have learned that one or more non-commissioned officers from the First Airborne Brigade worked closely with Yoshihiro Inoue, the 25 year old Intelligence

Minister of the Aum. These individuals either individually or in cooperation with other Aum members :

- Assisted in the November 27, 1994 burglary of a Metropolitan Police Department office to steal driver's license data;
- Assisted in the break-in of the Hiroshima factory of Mitsubishi Heavy Industries on December 28, 1994, in an attempt to steal technical documents on weapons such as tanks and artillery;
- Assisted in a firebombing attack on the Aum headquarters in Tokyo on March 18, 1995, in an attempt to inspire public sympathy for the Aum just before the Tokyo subway gas attack.
- Provided military training to other Aum members.

Additionally, the Staff has reviewed documents that indicate that JDF members also passed secret information to the Aum concerning the Metropolitan Police's planned raid on the Aum's facilities. This raid was supposed to occur on March 20th but was postponed because of the Tokyo subway gassing that occurred on that date. The Staff learned that these officers alerted the Aum of the anticipated raid and as a result the Aum initiated their deadly subway assault.

The Japanese Defense Forces were not the only victims of successful Aum penetration. The Staff discovered that the Aum recruited a number of police officers along with other low-ranking government bureaucrats. Former Aum members told the Staff that the Aum was actively attempting to recruit police officers. They remembered at least two active duty police officers being Aum members—one a Sergeant and the other an Assistant Inspector. The Staff was also told by former Aum members that the Aum wanted to recruit employees in the Prime Minister's personal office and in particular those employees who had access to statistical information concerning the Japanese government and economy. The Staff has no information indicating how successful the Aum was in the later attempts.

In addition, the cult actively recruited individuals in the Japanese business sector. Although not as well documented as other areas of activity, the Aum apparently targeted those industries that had technology or know-how that it needed for weapons production. There is some evidence that they successfully penetrated a number of Japanese defense contractors including Mitsubishi Heavy Industries Ltd. and Nippon Electronics Co. Ltd.

Japanese press reported that one of Mitsubishi's employees was arrested for assisting an Aum member who was an active duty Japanese Defense Force member in the theft of Mitsubishi research data. Mitsubishi publicly acknowledged the arrest of their employee, Hideo Nakamoto (38) and the theft of materials. However, they denied that this technical data was defense related.

In November, 1994, followers of the Cult were arrested on suspicion of breaking into the offices of Nippon Electronics Co., Ltd. (NEC). The purpose of the intrusion was to obtain information on laser technology from NEC's laser beams laboratory in Sagamihara, Kanagawa prefecture. When the police arrested Masanobu Iwao, who is alleged to have worked for the Aum's Intelligence Ministry, they discovered sketches and maps of the interior layouts of facilities at six major electronic firms. Also included in the materials seized were the names of dozens of Aum members who worked for major electronic and chemical companies in Japan. Police suspect that the internal diagrams of the firms were provided by Aum sympathizers/members from the various firms. Police were led to suspect Iwao of the NEC burglary when they found his portable personal computer and floppy disks at the scene of the crime.

B. Structure of the Aum: A Government In Waiting

The founder of the Aum, Shoko Asahara, occupies the top position of the Aum as its "Supreme Leader." Under him, the followers are classed into seven ranks of enlightenment. All owe complete allegiance to him.

Unlike other religions, the Aum was organized into Ministries and Departments that attempted to mirror the Japanese government. For example, under Asahara, the Cult had 24 identifiable organizations comparable to the Japanese government with similar functions and responsibilities. Thus, the Aum had ministries of defense, health and welfare, science and technology, heavy industry, education, etc. As with the Emperor of Japan, Asahara also had a "household agency" which provided security and medical care for his family. In addition, Asahara had a "secretariat" headed by his 11 year old daughter, Reika Matsumoto, whose duties are unknown.

The Staff has prepared a chart which will be made an exhibit that identifies all of the most important ministries. Although the cult had more members in Russia than in Japan, all of the highest positions in the cult were held by Japanese citizens.

These ministers along with the head of Asahara's "household agency" were part of the inner circle of advisors to Asahara. Unlike the tens of thousands of Aum members who are believed to have been innocent devotees of the Aum, this inner circle knew the true nature of the cult. Most have been arrested for helping to plan and carry out the Aum's known atrocities. Some of the members of this inner circle and their respective ministries are as follows:

- *Hideo Murai—Former Minister of Science and Technology.*—This was a key ministry which reportedly had over 300 members including a number of skilled scientists. It was responsible for the cult's scientific experiments and was the critical ministry for the production of the sarin nerve gas. Murai was probably the primary go-between to Japanese organized crime for the production of illegal drugs which is speculated to be the major reason for his murder on April 23, 1995. He was succeeded by Masami Tsuchiya, age 30, who was subsequently arrested for murder and attempted murder for the Tokyo subway incident. Tsuchiya is reported to have confessed that he led the group's sarin production team.
- *Kiyohide Hayakawa (45)—Minister of Construction.*—He was one of Asahara's chief advisors and considered the mastermind of the sect's growth and militarization. He was in charge of acquiring land, building all sect facilities and acquiring all of the technology and military hardware. He supervised the operations in the United States, Australia and Russia. He has been arrested for involvement in the Tokyo incident. He has also been recently indicted for the 1989 murder of Yokohama lawyer, Tsutsumi Sakamoto, and his family.
- *Yoshihiro Inoue (25)—Intelligence Minister.*—He was responsible for gathering intelligence on government counter measures against the cult as well as acquiring scientific and other technical materials. He has been implicated in most of the major burglaries of defense contractors as well as for the infiltration of the Japanese Defense Forces. He was arrested on May 15th for his involvement in Tokyo incident. He was recently implicated in the letter bomb attack on Tokyo Governor Aoshima.
- *Tomomitsu Niimi (31)—Minister of Home Affairs.*—This ministry was responsible for maintaining control and discipline over the membership. It was involved in most of the kidnappings and torture of dissident and runaway members. Niimi has been indicted for murder in regards to the Tokyo incident as well as the 1989 murder of the Yokohoma attorney and his family. He has also been publicly quoted as having confessed to the use of VX and sarin gas against former Aum members and critics.
- *Ikuo Hayashi (48)—Treatment Minister.*—He was a key player in developing the sarin for the Tokyo attacks. As a trained physician he was called upon to administer drugs to recalcitrant Aum members and played a role in distributing the sarin in the subway cars. He and his wife traveled to the United States to collect documents on the use of sarin. He has been charged with murder in regard to the Tokyo incident.
- *Seichi Endo (34)—Health and Welfare Minister.*—This minister and his ministry were responsible for the chemical and biological weapons research and development program. Endo worked closely with Masami Tsuchiya, head of the sect's chemical team and the successor to Hideo Murai, Science and Technology Minister, who was assassinated on April 23, 1995. Endo has confessed to his involvement in the sarin attacks and that Asahara had closely directed his research and development. Endo has been indicted for murder.

C. Financial Operations: Over $1 Billion

The Aum was very wealthy. Japanese government estimates place its assets at over 100 billion yen or approximately $1 billion. They also list 16 separate pieces of property in 11 different prefectures belonging to the Aum. They also note that the cult possessed a large amount of liquid assets including a large helicopter, boats, gold bars, and cash. Reportedly, the police recovered 700 million yen ($7 million) and 10 kilograms of gold ingots in just one of the buildings they raided.

The Aum amassed this fortune by a number of means. Not only did they require their followers to turn over all of their earthly possessions, they also came up with a number of ingenious and outlandish money-making schemes from running noodle shops and other legitimate businesses to extortion and selling their spiritual leader's blood and bath water.

According to the Aum's teachings, the only way to survive the Armageddon was to strictly follow the Aum's teachings and in particular, to renounce the world and all of its worldly possessions. This tied directly into another tenet of the Aum that demanded all members who wished to reach a higher state of consciousness to give all of their assets, including other family members' assets, to the cult. A majority of the Japanese members are believed to have innocently turned over most of their assets to the cult. This would run from a person's telephone credit card worth a few dollars to one's Tokyo residence worth millions. No one knows for sure how much money was raised in this fashion but it is imagined to have been staggering in light of the vehement protests that were raised by thousands of relatives of Aum members.

The Aum raised millions by also selling religious training and paraphernalia. A list of some of the items offered for sale is attached to the Staff statement as Appendix B. They ranged from headgear designed to synchronize one's brain waves to that of Asahara for $10,000/month to a 200cc bottle of water from Asahara's bath for $20. A significant amount was probably raised from these activities, although the total is not known.

The cult also raised funds in a perverse use of the Japanese Religious Corporations law to extort money. Because the law gives so much protection to religious groups, the Aum along with other legitimate religions could establish offices/churches almost anywhere. The Staff was told by former Aum members and government sources that they would use this legal guarantee to extort money from townspeople by threatening to come into their community. Apparently the Aum collected $9.2 million from one community on condition that it leave town.

The Aum also had legitimate businesses throughout the world that produced income for the cult. For example, in Taiwan it had an import/export agent. In Sri Lanka it maintained a tea plantation. The Aum was also involved in several different businesses in Japan. The cult's corporate affiliates ranged from the Maha Posya computer retailer to chains of "bento" (boxed lunch) shops and cheap Chinese noodle restaurants, a fitness club, a telephone dating club, and, unbelievably, a baby-sitting firm.

In July 1995 Japan press reports, citing police sources, said that the Aum paid over $400 million to companies in foreign countries over the past three years. The Japanese press reports that most of the amount, about $300 million, was paid to a Taiwanese company from a Japanese computer company run by the cult as the price for computers and computer parts purchased by the Aum. These press reports allege the Aum remitted some $1 million to accounts of a Russian company at banks in the Netherlands, Finland, and other European countries as broadcasting fees. The Aum also paid some $400,000 to an Australian company as fees for buying a farm and medicines, and nearly $100 million to other computer related companies in the United States and other countries, according to officials contacted by the Staff.

The amount of money earned by these enterprises is not known at this time. However, the size of their operations reflects a wealthy sect with extensive resources. The Staff has prepared an Appendix (Appendix C) which lists those properties and companies that we were able to document.

Another source of income for the cult may have come from illegal drug manufacturing. As will be explained in a later section, there appears to be credible evidence to suggest that the Aum was using its chemical expertise to manufacture stimulants and other illegal drugs for the Japanese underworld. Japanese government sources have concluded that the Aum produced and sold illegal drugs including stimulants and LSD. Whether or not they were also manufacturing these drugs for the Yakuza or mafia is still not fully proven but materials reviewed by the Staff seem to indicate a strong circumstantial tie between these two groups for the sale of drugs.

Despite these sources of income, some commentators have raised questions about whether the Aum was also obtaining funding from some other outside group, either foreign or domestic. Until more evidence is made public from the trials or records seized by the Japanese police, it is impossible to respond to these allegations.

D. Militarization of the Aum: Preparing For War With The West

The Aum was actively engaged in the preparations for both a conventional and unconventional attack upon the Japanese government and its people. This section will discuss the Aum's ambitious yet basically unsuccessful preparation for conventional warfare; the next section will detail the more successful and more frightening chemical, biological and nuclear preparation by the Aum to initiate Armageddon.

Much evidence of the Aum's militarization comes from former Aum members who have confessed to Japanese authorities the specifics of the Aum's militarization program. These confessions have been corroborated by weapons parts, equipment and records seized by Japanese police including the notebooks of Construction Minister Hayakawa and computer files found at the sect's offices.

The Staff learned that on April 6, 1995, a large number of components analogous to AK–74 submachine gun parts along with blueprints for their manufacture were found in a car owned by an Aum member. The AK–74 is the modern day version of the World War II era Soviet AK–47 assault rifle. Later, completed machine guns, additional parts, used rocket launchers and other military paraphernalia were found by Japanese police at the main Aum facility in Kamikuishiki. This is the same location where the sarin gas and biological facilities were located. The seized machine guns and parts resemble Russian-made AK–74s.

The Aum had apparently planned to illegally manufacture as many as 1,000 AK–74s and cartridges before the police raids. The Staff learned that the Aum had been manufacturing parts for these guns with the aid of computer-controlled machine tools at the Aum complex at the foot of Mt. Fuji since July 1994. Apparently Aum Intelligence Minister Inoue ordered the destruction of the weapons and lathes after the police raid on March 22nd. He had also instructed that they all be dumped into the reservoir located at Kusaki Dam in Gunma Prefecture. The Staff has learned that police searches of the area confirmed this information. Subsequent public statements by police authorities allege that over 100 Aum members were involved in the production of AK–74s.

It also appears that the Aum was interested in developing laser weapons. The Staff has learned from Japanese government sources that notations found in the Aum's Construction Minister Hayakawa's handwritten notebooks indicate that the cult was actively seeking information on the development of such weapons. These sources also indicate that apparently a number of Aum members traveled to Moscow to interview a Dr. Nikolay Basov, a purported Nobel Laureate and authority on this subject. The Staff has obtained Aum brochures with photographs purporting to show Dr. Basov with Asahara. In addition, as previously mentioned, the cult also attempted to steal technology from NEC's laser beam laboratory in Sagamihara in November of 1994. At the end of December, 1994, other Aum followers were arrested on suspicion of burglary at the Mitsubishi Heavy Industries Research Center in Hiroshima prefecture. They apparently broke into the facility on a number of occasions in an effort to steal documents and data on laser beam research.

An official Japanese document reviewed by the Staff, confirms these events and also indicates that in March, 1995, documents on laser technology, including blueprints for a laser gun were confiscated from one of the Aum members. Documents relating to laser technology were also found buried in the grounds near the cult's facilities in Fujinomiya, Yamanashi prefecture. Additionally, as set forth in section VI(C), *infra*, of this Staff Statement, the Aum's U.S. operatives were actively seeking laser technology.

Those same Hayakawa notebooks also include references to nuclear weapons and seismological weapons. As will be discussed in more detail in a later section on Aum activities in the United States and Russia, the Aum actively sought nuclear weapons technologies wherever they could find it. The Staff learned that data regarding nuclear weapons research was found on a number of laser discs seized during a police raid on March 23, 1995, from an Aum member.

There also appears to be evidence that the Aum sent a party of its members to the former Yugoslavia to research the work of Nikola Tesla, the discoverer of alternating current who experimented with the theory of seismic weapons before he died in 1943. Apparently these Aum members traveled from February to April, 1995 to the Tesla Museum in Belgrade to review Tesla's thesis and other research papers concerning “Tesla weapon systems” that focus on wave amplification. Their efforts in both Yugoslavia and in the United States to obtain such weaponry is discussed in section VI(D), *infra*.

The Aum was also interested in military training for its followers. The Staff learned from former Aum members that weapons and other military training was provided at an Aum training camp in Japan. Approximately 200 Aum members went for training in groups of 50 members. The training was provided by 3 brothers who were current active duty Japanese Defense Force members. These former Aum members also recalled seeing at least 50 AK–74s that were used for the training. They also said that the reason given to the Aum members for the training was that the Aum was going to produce a war movie and that the Aum members were being trained in order to realistically act in the movie.

These same former Aum members also recalled an incident where one of their friends brought back two Tokarev pistols from Russia. While in Moscow, Construction Minister Hayakawa had given the weapons with 16 rounds of ammunition to their friend, also in Moscow, with specific instructions to deliver them personally to Asahara. They never learned the purpose of the guns and their friend reportedly was startled when Asahara opened up the sealed package containing the guns in his presence.

The Staff has confirmed that “shooting tours” in Russia had been arranged by the Aum for some of its members as part of its efforts to provide military training. One such tour was scheduled for September 21–30, 1994. This trip was arranged through a travel agency which is a front company for the cult called "Devenir Millionaire', located in Kandanishiki-cho, Chiyoda-ku, Tokyo. As mentioned in section VI(C), *infra*, the cult also obtained helicopter training in Opa Locka, Florida.

According to the brochure distributed by the firm mentioned above, their training included shooting practice for automatic rifles at a Russian military base on the outskirts of Moscow. It also notes that former Spetznaz members, a specialized Russian military unit, would be providing the training. Although the Staff was told that some high officials of the cult did receive Spetznaz training in Russia, we could not confirm if this particular tour ever was carried out.

Finally, a number of private and government sources have confirmed that the Aum had constructed and utilized a microwave incinerator to actually burn out bodies of enemies of the cult or cult members who perished during training or through other cult activities. Apparently the Aum would place bodies into the device, comprised of a stainless steel drum connected to an industrial microwave, for three days and then soak the ashes into nitrate which would dissolve the calcium remains. A Japanese government document indicates that nearly two dozen bodies were disposed of in this manner.

E. Aum's CBW Program: Gas, Bugs, Drugs and Thugs

The Aum cult was aggressively involved in chemical and biological weapons production. Although, the extent of their success is not fully known to this date, the Staff found evidence that they successfully produced nerve agents such as Sarin, Tabun, Soman and VX, biological agents such as botulism and anthrax and controlled substances such as LSD.

Their operations involved chemical and biological research, development and production on a scale not previously identified with a sub-national terrorist group. They created a relatively sophisticated chemical and biological research facility without attracting the attention of either Japanese or foreign governments. In the course of these operations, they not only produced potential weapons but also illegal drugs for their own use and for sale to others.

The cult's motivation for the production of chemical and biological weapons is inextricably linked to its Armageddon prophesy. As previously mentioned, Asahara foretold Armageddon in 1997 and then moved the date to 1995. The cult had as a basic belief that there would be a major war between Japan and the United States that would involve weapons of mass destruction. Based upon our investigation, including discussions with Aum members and review of Aum propaganda, the cult developed these weapons in order to either be prepared for this cataclysm or to instigate it by pre-emptive strike against their Japanese and Western enemies.

1. *Chemical Weapons*

Just last week, on October 20th, Japanese prosecutors revealed the full extent of Asahara's plot to use deadly sarin gas to effectuate his version of Armageddon. At the initial arraignment against four cult members charged with conspiracy to commit murder, the prosecutor publicly charged that the four, under the direction of Asahara, planned to produce 70 tons of sarin within 40 days of completion of the sarin production facility, Satyam No. 7. The prosecutors told the court that the defendants made sarin gas on three separate occasions in November and December 1993. They also produced another 30 kilograms of the deadly substance in February 1994. The prosecutors added that 20 kilograms of this batch was used in the June 1994 Matsumoto attack which killed 7 people.

The cult gas squad was to spray the sarin via a helicopter the Aum had purchased. In furtherance of this conspiracy, the prosecutors charged the cult with the purchase of the Soviet-made helicopter. If the plot succeeded, Asahara had promised to promote the cult members involved to senior positions in the Aum hierarchy, the prosecutors revealed. The four defendants charged have admitted to the police their involvement in building the sarin plant but deny they knew its purpose.

It is clear that around 1992 the Aum began to research poisonous gasses including sarin and other nerve agents such as tabun and soman. From confessions and other information, the Japanese police now surmise that the Aum chose sarin because of its relative ease of production and the fact that the precursors for it were readily available.

The Aum elevated their efforts to develop and deploy sarin to near mystical heights. In speeches Asahara repeatedly refers to sarin. The Staff obtained and translated documents found at an Aum facility that included a December 30, 1994 manual on how to make sarin. The publisher of the manual was listed as Matsumoto Arnrin (the author's pun on the Matsumoto sarin incident). Within the manual, which includes chemical configurations for sarin, is a song entitled "Song of Sarin, the Magician" whose lyrics include:

"It came from Nazi Germany,
A little dangerous chemical weapon, Sarin—, Sarin—,
If you inhale the mysterious vapor,
You will fall with bloody vomit from your mouth,
Sarin—, Sarin—, Sarin—, the chemical weapon."

"Song of Sarin, the Brave"

"In the peaceful night of Matsumoto City
People can be killed, even with our own hands,
The place is full of dead bodies all over,
There! Inhale Sarin, Sarin,
Prepare Sarin! Prepare Sarin!
Immediately poisonous gas weapons will fill the place.
Spray! Spray! Sarin, the Brave, Sarin."

Also referred to in the manual was a reference to "Uncle Fester" as an American who would relate the know-how to produce sarin. Uncle Fester, the Staff has learned from U.S. experts on chemical weapons, is a popular underground pseudonym for individual(s) who publish information on producing terrorist devices. The Staff's brief search of the Internet discovered innumerable ways to obtain such information.

As the song indicates, sarin is a deadly nerve agent first synthesized in the 1930's. Other nerve agents with similar characteristics to sarin (GB) considered by the Aum are tabun (GA), soman (GF) and VX. They are all liquids not gases. They can all be absorbed through the skin, are volatile and, at high temperatures or when aerosolized by an explosion or other method, can be inhaled.

Standard medical textbooks describe sarin as a colorless, odorless liquid that is 500 times more toxic than cyanide gas. Only half a milligram of sarin can kill a person. As a "nerve agent", sarin belongs to a group of compounds that inhibit the enzyme acetylcholinesterase which breaks down acetylcholine at the junction between nerve endings. This leads to an increase in secretions from the nose, eyes, mouth, airways and intestines, twitching, weakness, paralysis and eventually death.

The initial effect of a small droplet on the skin may be unnoticed local sweating. The first systemic effects—nausea, vomiting and abdominal cramps, followed by a feeling of uneasiness and sometimes muscle twitching—may not begin until as long as 18 hours after exposure. A large exposure to liquid tabun, sarin and soman, or even a small amount of VX, within one to thirty minutes may cause sudden unconsciousness, convulsions and, within minutes, paralysis and apnea (asphyxiation).

Exposure to a small amount of vapor within seconds causes excessive constriction of the pupil of the eye, ocular pain, tunnel vision and dim or blurred vision. Bronchoconstriction and increased bronchial secretions cause symptoms varying from mild discomfort to difficult or labored breathing. With a large exposure, one or two breaths may lead to loss of consciousness within seconds, followed by convulsions and, within minutes, paralysis and apnea (asphyxiation).

Atropine, which was used by our troops in the Persian Gulf war, is an antidote for Sarin and other nerve agents. Atropine blocks the action of excess acetylcholine thereby stopping the deadly build up that results in the increased secretions.

Starting in the Spring of 1993, the Aum utilized its own chemical company to start acquiring the chemical agents and other materials necessary for full scale production. Sarin research and production was conducted under the direction of Masami Tsuchiya, head of the cult's chemical team and Seiichi Endo, the cult's Health and Welfare Minister. Production occurred at a facility in the Aum compound site in Kamikuishiki called Satyam No. 7.

Reports from Japanese officials indicate that the sarin production facility was extremely sophisticated. It was almost all fabricated by the Aum members themselves who utilized their other companies as sources for material and technical expertise. According to prosecution sources, the cult produced 30 kilograms of sarin from their computerized chemical plant sometime in early 1994 before an accident caused them to shut down operations. It is believed that the sarin for the June 27, 1994 Matsumoto incident was made at this facility before the accident.

Apparently the sarin actually used for the Tokyo incident was made on a smaller scale at a laboratory inside the Aum compound on March 19, 1995, the day before the Tokyo subway incident. Unconfirmed reports indicate that there may be some sarin missing from the cult's stockpiles. One such report indicates that Aum members may have buried sarin at undisclosed locations.

As previously noted, the Aum also tried to develop other chemical weapons such as soman, tabun and VX. The Staff confirmed from official documents that the Aum produced VX on at least four separate occasions in the same facility used to produce the Sarin compound. They were developed under the direction of Masami Tsuchiya for experimental purposes but full scale production never occurred.

There is credible evidence that the Aum did deploy small quantities of VX, one of the deadliest nerve agents known, on at least two occasions. Confessions from a number of Aum members implicate Tomomitsu Niimi, currently under arrest, for deploying this weapon on a number of enemies of the Aum. Japanese authorities have been quoted in the press as saying that Niimi has confessed to this crime.

The Staff confirmed from official documents that Niimi and others were involved in at least two attacks. They include the attack on Tadahiro Hamaguchi with VX on December 12, 1994, while he was walking on an Osaka street. Hamaguchi died ten days later on December 22nd. The police detected "mono-ethyl-methyl phosphoric acid", a by-product produced only from VX, in Hamaguchi's blood serum on July 22, 1995, confirming the presence of VX. In another incident, Niimi attacked Hiroyuki Nagaoka, 57, the head of the "Association of the Victims of Aum Shinrikyo" with VX gas in January, 1995. He fortunately survived but was in a coma for several weeks per a Staff conversation with his son. It was dispensed by spraying it from a hyperdermic syringe into the face of the victim. Nagaoka's son told us that his father survived because his assailants missed his face.

The Japanese police believe that there may have been a third incident of VX deployment although they have not identified the victim or other circumstances in any detail. The Staff has learned from government sources that the incident involves an 83 year old Tokyo man who collapsed in his house in December, 1994 from what is alleged to have been an Aum sponsored VX attack. The man never reported the incident to the police or authorities.

From a Japanese government document the Staff has learned that after the Nagaoka incident, the Aum retained some excess VX. This material had not been found by the police in the initial series of raids. It is believed that this VX may be in the possession of one or more Aum members who were still at large at the time of the preparation of this Staff statement.

Ominously, there have been police reports cited in the Japanese press that sodium cyanide, linked to cult members, was found in late September 1995, in Japan. Police found as much as 8.5 kilograms of the sodium cyanide in the apparent hideout of an Aum fugitive, according to Japanese police sources. The sources said that the amount of sodium cyanide found in 17 bottles could kill approximately 70,000 people. The cyanide was found by hikers in September around a tent strewn with camping gear in a mountainous area of Japan where cult member, Satoru Hiratu, a member of the intelligence ministry, is believed to have hidden between mid-May and early September. Sodium cyanide was found in devices designed to generate highly toxic cyanide gas that were found in subway station in Tokyo in May and July. Hirata is on the wanted list for alleged involvement in the death of a Tokyo public notary official.

In the days following the subway attack in March, Asahara video-taped a reply to allegations of their chemical weapon build-up. In his rambling statement, a transcript of which was obtained by the Staff, he implicitly confirms the cult's possession of the chemicals, but seems to claim they are for other purposes. Throughout the statement he emphasizes his Armageddon theories and claims that half of his 1700 monks and nuns have been sprayed with Q-fever.

2. *Biological Weapons*

Materials seized at the Aum facilities and other evidence confirms that the Aum had embarked upon an intense research and development program for the production of biological weapons. Judging from this evidence, Japanese authorities believe the Aum succeeded in producing botulism toxin. The same Japanese authorities are less certain but have serious concern that the Aum had also produced anthrax bacillus.

Both botulism toxin and anthrax are viewed by experts as serious weapons of mass destruction. In a 1993 report of the Office of Technology Assessment, it is noted that botulism toxin is a poison made by a bacterium, Clostridium botulinum. It is one of the most poisonous substances known to man. The fatal dose of botulin toxin by injection or inhalation is about 1 nanogram (a billionth of a gram) per kilogram of weight. This would equate to about 70 nanograms of botulin toxin to kill the average adult male. The toxin is also relatively fast-acting, producing death between 1 to 3 days in 80% of the victims. (See: *Technologies Underlying Weapons of Mass Destruction*, Office of Technology Assessment, 1993)

Anthrax is the name given for a severe illness caused by the bacterium Bacillus anthraxis. It is considered one of the prototypical biological-warfare agents. In nature, anthrax is primarily a disease of cattle and sheep but can also infect humans. It can survive for long periods of time in the soil in a dormant state. After infection, it reverts to an active phase in which it multiplies rapidly in the host body and secretes deadly toxins. (*Ibid.*)

After inhalation into the lungs, anthrax spores travel to the lymph nodes of the chest, where they become active, multiplying and releasing three proteins that function as a potent toxin. This toxin results in uncontrollable hemorrhaging and fatal tissue damage. In addition to its lethality anthrax has other characteristics that make it an attractive BW agent including the ease of production. (*Ibid.*)

The Staff has confirmed that Seiichi Endo, Health and Welfare Minister for the cult, confessed that he had been working on developing biological weapons and was close to finalizing this effort before the Tokyo incident. He claims to have embarked upon this work under the specific directions of Asahara. Other Aum followers have also confessed to their involvement in the biological program at the cult's Kamikuishiki compound.

In the compound, the police have found large amounts of equipment that is indispensable for cultivating bacteria and viruses. Also uncovered were large amounts of "peptone," a substance used to cultivate bacteria, as well as quantities of books and materials on the production of botulism, cholera and dysentery. The amount of peptone seized was phenomenal. Apparently there were 100–200 metal drums of peptone seized at the Aum facilities, each having a capacity of 18 liters. By comparison, university research classes are said to typically use only about one liter of peptone per year. Thus, the Aum were expecting to propagate a huge quantity of bacteria.

Subsequent discoveries by the police were equally disturbing. It appears from official Japanese government material reviewed by the Staff that the police determined that Seichi Endo had produced an antibody for botulinus and was constructing a four-story concrete facility for further development of biological weapons at another Aum site in Naganohara. That facility was to be equipped with a so-called "clean room" with specialized ventilation systems and a sealed room for protecting cultivated bacteria from leaking.

The Staff has been told by a number of credible sources that the actual building used for the production of bacterial agents has yet to be fully searched by Japanese authorities. All of the materials recovered so far have been from ancillary buildings located on the Kamikuishiki site, not from the actual production facility. These sources have warned us that up to the date of the Staff's visit to Japan in late August, Japanese authorities had merely sealed this building after a cursory inspection from its doorway. These sources contend that the police have not gone into it because of concerns over its unknown contents. At a later date when more information has been gleaned from informants and records the police intend to launch a thorough review of material and cultures included in the building.

Probably the most chilling of all the reports coming out of Japan were those that the Aum had actually attempted to use bacteria warfare. The Staff has learned that a number of devices were found by the police in Tokyo that authorities believe may have been intended to disperse anthrax. Three attache cases were discovered on March 15, 1995, five days before the Tokyo gas attack, at the Kasumigaseki subway station in Tokyo. Each contained a small tank to hold an unknown liquid, a small motorized fan and a vent and battery. Unfortunately, none of the liquids were recovered for analysis. Experts have told the Staff that these devices were crude dissemination devices for bacterial or chemical agents. Additionally, the Staff has learned from a number of government sources that the cult had obtained at least two radio controlled drone aircrafts whose likely use was also to distribute biological weapons.

In addition, the Staff has recovered documents from the Aum's attempts to purchase material here in the United States that may be relevant to their biological program. As discussed in greater detail in Section VI(C), *infra*, the Aum wanted to obtain hundreds of camcorder batteries and small fans as well as thousands of small serum bottles. All are similar to the components used in the attache cases.

The Staff has also learned that the police suspect that the Aum dispersed anthrax bacilli at their Tokyo headquarters. This belief is based upon a confession by one of the former Aum members. The event occurred in June, 1993 and coincided with complaints from neighbors of a foul odor. The police report that the Aum's Tokyo headquarters building seemed to have been equipped for bacteria production.

Equally disturbing have been a number of press reports in late May of 1995 concerning the Aum's interest in the Ebola virus. The Staff has confirmed that members of the Aum sent a purported medical mission to Zaire in 1992 to assist in the treatment of Ebola victims. The press reports allege that in actuality the Aum was attempting to find a sample of the Ebola strain to take back to Japan for culturing purposes. This is entirely believable in light of their confirmed and aggressive biological weapons program.

In support of these claims, the Staff was told that in a December, 1994 broadcast from Moscow, the Aum's Health and Welfare Minister, Seichi Endo discussed the use of Ebola as a potential biological warfare agent. Apparently a copy of this speech was transcribed by the cult and printed in Japanese in one of their publications. The Staff has to date been unable to find which of the many hundreds of documents published by the Aum contained this speech. However, the Staff has confirmed from Aum documents that in October of 1992 Asahara and 40 followers traveled to Zaire for "medical assistance" to that country.

3. *Illegal Drug Production*

The Japanese police strongly suspect that the Aum was using its chemical weapons development program to also produce illegal drugs, including stimulants and LSD. The police also believe that the Aum had an arrangement to sell their drugs to Japanese organized crime, the Yakuza. The police also have credible evidence to believe that some of the drug production was being used by the Aum leadership on its membership and new recruits for thought-control purposes.

In support of these charges, the Japanese police report they have found a notebook of one of the Aum leaders detailing the production process for illegal stimulants. The police allegedly discovered a number of precursors for the production of stimulants. The police have also determined that a number of senior Aum members attempted to sell large quantities of drugs to various Japanese organized crime groups. Information garnered by the police indicated that the Aum drugs were not popular because they were, in the words of one police informant, "garbage."

The police allegedly have obtained confessions from a number of Aum members that discuss the use of drugs in the initiation rites of the Aum. A number of these members described hallucinating after being given unknown substances. Traces of LSD and other illegal drugs have reportedly been found in blood samples of a number of Aum members. In addition at least 10 grams of LSD powder was confiscated from the cult's Satyam No. 2 building.

The Staff has learned that Masami Tsuchiya, head of the Aum's chemical team, has confessed to the police that he produced LSD for the cult. The police report that Tsuchiya admitted to systematically producing LSD and other drugs for use on Aum members and for sale. Apparently implicated in this scheme was former Construction Minister Hayakawa whose hand-written notes list the chemicals needed to manufacture LSD.

V. Crimes of the Cult

A. Murder And Mayhem: Precursors To Gas

In the days following the subway gas attack on March 20, 1995, as suspicion fell on the Aum, most people outside of Japan learned for the first time of this rather obscure Japanese religious sect. To most, their criminal actions of March 20th were out of character for a religious group. Yet, a closer review of the Aum's history show that this group's character had a common thread of criminality leading back to almost the date it was legally chartered. They include murder, attempted murder, kidnappings and burglaries. These incidents, most of which only became known to the outside world in the aftermath of the Tokyo attack, have led many to conclude that Japanese authorities should not have been surprised by either the subway attack or its perpetrators.

This section of the Staff statement will briefly chronicle the most serious of the criminal acts of the Aum cult leading up to the tragedy in the Tokyo subway. Their recitation provides an accurate portrait of this group's criminality. It also serves as a reminder of the consequences of government inaction. A number of Japanese Aum experts interviewed by the Staff charged that their own government's inability or unwillingness over the years to investigate the Aum led to the cult's delusion of invincibility. They noted that the cult regularly snatched former members and enemies off the street without any police interference. This immunity just emboldened the Aum to more outrageous conduct in their opinions.

The following is a partial chronological list of criminal activities of the Aum cult leading up to the Tokyo gassing attack of March 20, 1995.

A longer, more detailed chronology of major events in the history of the Aum cult is attached as Appendix D:

Name	Title
1989	Parents and family members of Aum recruits complain to law enforcement officers that the Aum was kidnapping and physically assaulting recruits and family members of recruits.

Name	Title
Nov. 1989	Mr. Sakamoto, a lawyer representing anti-Aum groups, and his wife and one-year-old son are kidnapped and murdered. After the Tokyo attack, Aum members confess to the crime and the families' remains are found.
Oct. 1990	Aum members found guilty in Japanese court of violating the Utilization of Land Planning Act.
Oct. 1992	Aum "medical mission" sent to Zaire to obtain a sample of the deadly Ebola virus.
1993	Aum begins research into and production of chemical agents.
June 1993	Noxious fumes from a building believed to be affiliated with the sect cause approximately 100 people to complain in the Koto ward of Tokyo. Following the sarin gas attack in Tokyo, Aum members told Japanese officials that the Aum dispersed anthrax bacilli at their Tokyo headquarters at this time.
Sept. 1993	Two Aum members plead guilty to carrying dangerous chemicals on an airplane in Perth, Australia.
June 1994	Sarin gas attack in Matsumoto, 7 people died and over 200 injured. The sect purchases and smuggles an MIL–17 helicopter from Russia to Japan.
July 1994	Cult begins manufacturing AK–74s. A hazardous odor smelled near the premises of Aum in Yamanashi prefecture.
Sept. 1994	Miyazaki Prefecture police accepted a complaint and charged the cult with plundering an inn owner of his receipts.
Nov. 1994	Aum members broke into the Tokyo Metropolitan Police Department in order to steal driver's license data. Followers were arrested on suspicion of breaking into the offices of Nippon Electronics Co. The purpose was to obtain information on laser technology.
Dec. 1994	Aum members broke into the Hiroshima Factory of the Mitsubishi Heavy Industries in order to steal technical documents on weapons such as tanks and artillery.
	Aum members killed Tadahiro Hamaguchi by spraying him with VX while he was walking on an Osaka street.
	Aum may have attacked an 83-year-old man with VX gas.
Jan. 1995	Tomomitsu Niimi alleged to have sprayed VX gas at Hiroyuki Nagaoka, head of the Association of the Victims of Aum Shinrikyo. Nagaoka survived but is in a coma.
Feb. 1995	A village office administrator was kidnapped. Killed by drug injection. Body burned in microwave incinerator located in underground room in Satyam No. 2. PAum follower, Kotaro Ochida, a pharmacist, is hanged in the Aum facilities. His body is burned in microwave incinerator. Eight other bodies were burned in the incinerator.
Mar. 1995	Prior to the 20 March sarin gas attack:
	Aum members assisted in a firebombing attack on the Aum headquarters in Tokyo in an attempt to inspire public sympathy for the Aum just before the Tokyo subway gas attack.
	Three pieces of luggage containing sprayers were placed in the Kasumigaseki subway station.
	An Osaka University student was injured, captured and confined by Aum members.
	Six former Aum members were confined by Aum members, police found them during raids on Aum facilities following the sarin gas attack.

B. Matsumoto: A Dry Run For Tokyo

On March 20, 1995, to the public at large, a new form of terrorism was unleashed with the Aum's release of its deadly sarin gas in the Tokyo subway system. Yet the events leading up to that incident confirm that the Aum had used sarin to kill before in Matsumoto, a small industrial and resort city of several hundred thousand people 100 miles west of Tokyo.

Late in the evening of June 27, 1994, a substance later identified as sarin seeped through the open windows of apartments and houses in the Kaichi Heights neighborhood near the old heart of the city. Seven people eventually died and over 500 people were injured including a number still in comas.

Suspicion initially fell on a former chemical salesman at whose residence various chemicals were found. He was believed to have accidentally released the gas while mixing a home-made batch of herbicide for his garden. This later turned out to be physically impossible since none of the compounds found in his house could have caused the toxic results of the incident. In addition, traces of sarin were found near where witnesses had seen individuals in a vehicle releasing some type of gas.

This and other evidence led a number of non-government experts to suspect terrorist involvement in the Matsumoto affair. Kyle Olson, in January 1995, provided the most accurate analysis of Matsumoto, viewing the event as the handiwork of unnamed terrorists. He opined that it was merely a dry run and that the next sarin attack would be in the Tokyo subway system. Other commentators noted the interest of the Aum in sarin and clearly hinted that the Aum may have been behind the Matsumoto incident.

It was not until after the police arrests subsequent to the Tokyo incident that uncontrovertible evidence was developed linking the Aum to Matsumoto. The Staff has confirmed that the Japanese police have confessions from a number of Aum followers implicating the Aum to this gas attack. Masami Tsuchiya, head of the cult's chemical squad, has admitted he developed the sarin used for the attack and that Hideo Murai, the deceased Science and Technology Minister for the Aum, and six other senior cult members were involved.

Tsuchiya also has provided the police a motive for this incident. He has indicated that the Aum attack was linked to a court case then being heard in Matsumoto. The Aum was then defending itself against fraud charges brought by various land owners in Matsumoto. On May 10th, the trial had concluded and the verdict was scheduled to be released on July 19, 1994. The Aum decided to target the three judges hearing the case in order to prevent them from returning a decision against the Aum.

The sarin was released within 30 feet of the dormitory where the three judges were staying. All three judges fell ill as a result of the attack and the decision was delayed as planned by the Aum. As of the Staff trip to Tokyo, the Matsumoto court has still not reconvened to release its decision.

Tsuchiya has also told the police that initially they had planned to attack the judges while they were working in the Matsumoto branch of the Nagano District Court. Only after arriving there did they learn that the judges had left the courthouse and returned to their residences. They then proceeded to the parking lot next to the judges dormitory and sprayed the sarin out of a nozzle device attached to a truck specially outfitted for that purpose. Apparently an electric heater was used to heat the liquid into a gaseous state for dispersal by an electrically powered fan. The gassing lasted for approximately 10 minutes releasing a gas that was carried on a southeasterly wind into the targeted residences.

Tsuchiya also confirmed that the Aum used Matsumoto as a test run. The cult had never before tried the sarin gas on a large scale dispersal. Matsumoto proved to them that they could effectively deliver it. The police have recovered portions of the truck and the special fittings used in the Matsumoto attack.

Apparently the truck and its device were taken apart soon after the Matsumoto incident so it was not available to be used the following year in Tokyo. It has been suggested that the Aum quickly destroyed this device when an accidental spill of sarin at their Kamikuishiki facility looked like it was going to attract police attention. On July 9th, two weeks after Matsumoto, the dairy farming region near the Aum compound was swept by a strong and strange odor that allegedly killed vegetation near the Aum compound. Police were called to the scene but were denied access to the sect's compound. Although the police did not pursue the matter any further, the Aum apparently was concerned that they might discover the Matsumoto vehicles and therefore destroyed the evidence.

This would later have ramifications to the citizens of Tokyo. When it came time for the Aum to strike again, it has been surmised that they lacked their only tested delivery system. Its absence may have played a major role in the Aum's choice of target and method of delivery.

C. Tokyo: A Nightmare In The Morning

On the morning of March 20, 1995, the Aum attempted to murder tens of thousands of innocent people in order to create unimaginable disorder and chaos. Unlike the earlier Matsumoto incident in which the Aum targeted a specific group of people, the Tokyo subway attack involved the indiscriminate use of the chemical nerve agent sarin on an enormous civilian population. Had the chemical mixture and delivery system been slightly different, the resulting tragedy would be unprecedented, if not beyond comprehension.

The Aum's plan was to place approximately eleven small containers of sarin on five trains running on three major lines of the Tokyo subway system (Marunouchi, Chiyoda and Hibiya). The subway system has over 5 million riders daily. The selected trains were scheduled to arrive at the central Kasumigaseki station within four minutes of each other at the height of the morning rush hour between 8:00 and 8:10 a.m. The containers, which were made out of nylon polyethylene and wrapped in newspaper, were placed on baggage racks or left on the floor and punctured by Aum members to release their deadly cargoes of sarin.

The station towards which the cars were converging, Kasumigaseki, is one of the largest where a number of subway lines converge. It is also at the heart of Tokyo's government district. Within walking distance is the Ministries of Foreign Affairs, Finance, Tax Administrator, Labor, Health & Welfare, as well as both the Tokyo Police and the National Police Agency (the equivalent of the FBI). Many of the riders who use the Kasumigaseki station are employees and officials of those agencies.

As planned, most of the stricken trains converged at the height of rush hour and disgorged their sick and frightened passengers. The Aum's plan succeeded in killing twelve and injuring 5,500 people. It also succeeded in causing panic and chaos in the station and throughout Tokyo as commuters and subway workers alike collapsed into severe fits of coughing, choking and vomiting. It was only a fortunate mistake by the Aum in the preparation of the special batch of sarin used that day and the inferior dissemination system used to deploy it that limited the number of casualties. If not for these mistakes, the Staff has been told by chemical weapons experts, tens of thousands could have easily been killed in this busy subway system that moves over five million passengers a day.

Despite the poor quality of the sarin and its inadequate delivery system, the scene under the streets of Tokyo that morning was terrifying. Reports reviewed by the Staff describe men, women and children in panic, coughing uncontrollably, vomiting and collapsing in heaps. On one of the platforms over 30 passengers collapsed after being overcome with fumes that were strong enough to be smelled one floor above at the ticket counters. Subway workers and other emergency workers who first arrived on the scene quickly became victims themselves.

One first hand account reviewed by the staff was from one of the two Americans injured in the event. This civilian U.S. employee stated that the first indication he had of a problem was when he changed trains at Kasumigaseki station and noted a peculiar odor. He waited for a train for approximately 20 minutes without realizing what was going on, in part because he spoke little if any Japanese. During this time he began to experience troubled breathing, headache, and pain in his chest and throat. He explained that the harder he tried to breathe the more his chest hurt. By the time he was taken to the hospital he had lost most eye-hand coordination and voluntary control over his bodily functions. He soon lost consciousness and had to be revived at the hospital. Fortunately, he survived and has fully recovered.

The Tokyo attack was first widely viewed as the long-prophesied attack by the Aum on the Japanese government. Because all of the trains targeted were scheduled to arrive at Kasumigaseki station, it was believed that the attack was targeted on the numerous government bureaucrats working there.

However, the Japanese government now believes that the gas attack was meant merely to be a diversionary feint in anticipation of a planned government raid against the Aum. The Staff has learned that the police have evidence that the Aum leadership planned the Tokyo attack after they discovered that the police were going to raid their facilities in search for a kidnaped notary public. (It later was discovered that the Aum had killed this individual.) They, including Asahara, the Aum's Construction Minister Hayakawa, the Aum's Home Affairs Minister Niimi, and the Aum's late Science & Technology Minister, Murai, reasoned that the sarin attack would disrupt the police investigation, delay the searches and give them additional time to flee or destroy incriminating evidence.

The Staff learned that the police have evidence that showing after Asahara approved the sarin attack, Murai was given the task of carrying it out. He, in turn, met with Ikuo Hayashi, the Aum's Treatment Minister, Tomomasa Nakagawa, an Aum doctor, and Seiichi Endo, the Aum's Health and Welfare Minister, to decide upon the specific plan of attack. They decided to use the bags of sarin placed on the specific trains.

Specific assignments were given out. Ikuo Hayashi was assigned to place the sarin bags on the Chiyoda line; Toru Toyoda and Yasuo Hayashi the Hibiya line; and, Masato Yokoyama and Kenichi Hirose the Marunouchi line. Five others were selected as lookouts and drivers—Tonomitsu Niimi, Shigeo Sugimoto, Kouichi Kitamura, Katsuya Takahashi and Kiyotaka Sotozaki. Yoshihiro Inoue, the Aum's Intelligence Minister, was assigned to be field supervisor for the operation.

The various teams carried out their missions and then returned to a special hideout in Tokyo where they each were given an injection of an antidote for sarin. They then changed their clothes and burned those they had worn as well as the umbrellas used to pierce the sarin packages. When they reported their successful operation to Asahara, he is reported to have commented "how nice it is that their souls were removed by Shiva."

Within days of the Tokyo subway attack, the law enforcement community and the public-at-large scrutinized the Aum as the group responsible for the tragedy. Among the documents obtained at the cult's New York office, the Staff found scraps of paper that when pieced together appear to be an English translation of Asahara's March 24th defense of the cult that was publicly disseminated. In the statement Asahara claims he has been sprayed with poisonous gas along with hundreds of his disciples. He further attempts to explain away the tremendous stockpiles of chemical weapon precursors that were discovered by Japanese authorities days earlier. Specifically, he claims the chemicals were for legitimate manufacturing purposes.

The Staff has asked chemical experts to review Asahara's March 24th explanation to assess the scientific veracity of his claims. The experts advised the Staff that Asahara's claims are "not believable" based upon Asahara's asserted usage of the chemicals. Furthermore, the experts confirm that the various chemicals all have general or specific applications in the development of chemical weapons such as sarin and cyanide gas.

D. Post Tokyo: The Terror Continues

From March 23, 1995 through September 4, 1995, the police have conducted over 500 raids on approximately 300 locations, confiscating 66,000 items of evidence in their investigation of the Aum. The number of Aum followers arrested have reached 398 in 240 separate cases. Those arrested and or indicted have included almost the entire hierarchy of the cult. They have been charged with a variety of offenses ranging from murder, conspiracy, kidnapping, assault, kidnapping, obstruction of justice, harboring, and theft, to petty traffic and licensing offenses. Many of those charged have started to appear for trials, including Asahara who was scheduled to start trial on Thursday, October 26th. He fired his attorney the day before the trial.

Despite this aggressive response from the Japanese authorities, criminal activities of the Aum did not come to an end. As a matter of some concern, a number of significant events have occurred since the Tokyo subway incident involving the Aum.

For example, on *March 30, 1995*, only ten days after the sarin subway attack, Takaji Kunimatsu, the Commissioner General of the National Police Agency, was shot by a lone gunman. Japanese government material, obtained by the Staff, reveal this shooting occurred in front of his residence as he was leaving for work. He was seriously wounded by three shots from what police believe was a U.S. made Colt 38 caliber revolver. The would-be assassin fired four time from a distance of approximately 60 feet away. He then fled from the scene on a bicycle.

Although the assailant is still at-large, the Aum has been implicated in the crime by a police investigation that resulted last month with the police arresting Mitsuo Sunaoshi who belonged to the Aum's Construction Ministry.

On *April 15, 1995*, the entire country was put on alert over rumors that Asahara had predicted something terrible was going to happen on that date. Although nothing occurred, over 20,000 additional police were deployed in full riot gear, bulletproof vests and gas masks throughout Tokyo. Many stores shut down out of concern over a potential gas attack. Scores of people stayed away from work or avoided the subway system.

Four days later, on *April 19, 1995*, in what appears to be a copy cat attack, more than 500 people were sickened and taken to hospitals complaining of stinging eyes, sore throats, nausea, coughs and dizziness after inhaling a mysterious gas released in three different places around Japanese Railway's Yokohama Station. Most were released that day from the hospital and no serious injuries or deaths occurred. The Police originally claimed evidence of phosgene but later retracted that statement and indicated they could not identify the substance. The police have arrested a non-Aum.

Then, on *April 23, 1995*, one month after the subway incident, Hideo Murai, the Aum's Science and Technology Minister, was stabbed repeatedly while in front of the Aum headquarters. He later died from his wounds. His assailant, Hiroyuki Jo, was immediately arrested for this daring attack that occurred in front of hundreds of police and press cameramen.

Weeks later, a member of Japanese organized crime, Kenji Kamimine, was arrested in regards to this murder. The police suspect that the murder of Murai had been ordered by either organized crime or Asahara in order to prevent him from revealing their relationship. The case continues to be investigated.

On *May 5, 1995*, the Aum struck again by attacking Shinjuku Station, one of busiest in Tokyo, with another chemical weapon. In this case, the Aum used sodium cyanide placed in a public restroom. The chemical device was a rather simple binary weapon consisting of two plastic bags, one containing 2 liters of powdered sodium cyanide and the other containing about 1.5 liters of diluted sulfuric acid. When discovered, the bags were ablaze. Had they broken open a chemical reaction would have occurred producing deadly hydrogen cyanide gas. Chemical experts have estimated that the amount of gas that would have been released would have been sufficient to kill between 10,000 and 20,000 people.

On *May 16, 1995*, Asahara was finally arrested. That evening, the Aum again struck. A letter bomb mailed to the Governor of Metropolitan Tokyo exploded in the hands of his secretary, blowing off the fingers of his left hand. Five members of the Aum, including its Intelligence Chief Inoue, were indicted for producing and posting the explosive on May 11th.

As late as *July 4, 1995*, another gas attack was averted in Tokyo. Again, this involved hydrogen cyanide and a rest room. In this case 4 devices were found in rest rooms at the Kayaba-cho, Tokyo and Ginza subway stations and the Japanese Railway suburban Shinjuku station. The devices were different than the ones used on May 5th but all used the similar principal of mixing two separate bags containing sulfuric acid and sodium cyanide. None of the devices worked.

The threat still remains that other devices may be employed in the future especially during some of the more important trials. The Staff has been advised that not all of the chemicals produced by the Aum have been accounted for, nor have all of the more fanatical members been arrested. As an example, up to at least early September during the Staff's fact-finding trip, the entire city of Tokyo was festooned with wanted posters for some of the Aum members. In addition, the Aum still has substantial funds. Only a portion of its original $1 billion assets has been seized or frozen by authorities.

Until all of the fanatical members, their weapons of mass destruction and their assets are accounted for, there is still some justification for the Japanese to be concerned. Additionally, until our government is satisfied that it knows all that it needs to know about the capabilities of the Aum, including its shopping list of high tech items, its intentions involving our Nation and its international links to other countries, we in the United States are justified to be concerned.

VI. OVERSEAS OPERATIONS

One reason why we in the United States should be concerned about the Aum is because of the truly global nature of the cult. In this section we will examine the Aum's activities in seven different countries on four different continents, including Russia and the United States.

A. The Aum Shinrikyo in Russia

1. *The Organization*

Through a number of private and government sources, including Aum documents, the staff has confirmed that the Aum began its activities in Russia in 1991 and the organization there quickly grew to become the Aum's largest organization in the world. The first followers registered in Moscow in 1991 and, in June 1992, the Russian Ministry of Justice registered the cult as an official religious organization.

There are many allegations in the Japanese and Russian press about Aum activities in Russia. The Staff was unable to confirm many of these allegations while in Moscow investigating this issue. Through briefings over the last several months, the Staff also learned that U.S. government officials have been unable to confirm or deny many of the allegations.

Following the sarin gas attack on the Tokyo subway, two Russian Duma committees began investigations of the Aum—the Committee on Religious Matters and the Committee on Security Matters. A report from the Security Committee states that the Aum's followers numbered 35,000, with up to 55,000 laymen visiting the sect's seminars sporadically. This contrasts sharply with the numbers in Japan which are 18,000 and 35,000 respectively. The Security Committee report also states that the Russian sect had 5,500 full-time monks who lived in Aum accommodations, usually housing donated by Aum followers. Russian Aum officials, themselves, claim that over 300 people a day attended services in Moscow. The official Russian Duma investigation into the Aum described the cult as a closed, centralized organization.

The Russian Duma has reported that the Aum had eleven branches outside of Moscow and at least seven inside of Moscow. Some of the other Aum headquarters in Russia were located in St. Petersburg, Kazan, Perm, Vorkuta, Tyumen, Samara, Vladivostok, Elista, and Vladikavkaz.

According to Russian press reports, the Aum was very specific in targeting its recruiting in Russia. The majority of the Russian Aum members were disaffected university students. According to a Russian press report that claims to have access to forms that prospective Aum members filled out, the sect asked prospective members to choose the subjects among 24 fields they wanted to pursue in the future. Physics, chemistry, and biology were reportedly the top three areas listed.

Based upon official Japanese documents and numerous press reports and Staff interviews, the Staff has confirmed that in 1992 the Aum bought radio time from one of the largest radio stations in Russia—the state-run Mayak Radio—under a 3-year contract. The contract cost $800,000 per year, according to a Russian press report. The Staff has confirmed that the Aum broadcast an hour long program on a daily basis. The broadcasts were also relayed via an Aum radio tower in Vladivostok to Japan every evening. The Staff was told by U. S. and Russian government sources that the Aum, also, either owned or leased a radio station in Vladivostok. Aum programs were also televised on Russia's "2X2" television station.

A Russian press report claims that according to a sect document distributed to Russian followers, the Aum planned to form a company in Russia. The document states that Asahara was predicting an economic crisis in Russia that would lead to increased unemployment. The document asked Aum followers in Russia to quit their jobs and work for this company. The document said that Aum would train its Russian followers in agriculture, medicine, science, and legal services.

Japanese and Russian press reports claim that the Aum formed a security company in Moscow in 1994. Japanese reporters obtained copies of the registration papers for this company, called "Aum Protect." According to the address on the registration documents, the firm was located in the same building as the Aum's Moscow headquarters and was established with initial reserves of 2.5 million rubles (approximately $160,000). The Japanese press claims that this Aum company's staff of twelve had permits to bear arms from Russian authorities and they had received special training in the Russian armed forces. According to former Russian Aum members, quoted in the Russia and Japanese press, "Aum Protect" was used to put physical pressure on sect members who wished to leave the cult.

Even before the Tokyo sarin gas subway incident, the Aum had become controversial in Russia. According to Russian press reports, at the end of 1992, parents of cult members, lead by a Russian Orthodox priest who claims to have deprogrammed up to fifty Aum members, initiated a civil lawsuit against the sect. On July 15, 1994, Russia's Ministry of Justice annulled the registration of the Russian branch of the Aum on technicalities having to do with the registration procedure, according to Russian press reports. A few weeks later, however, the organization was re-registered by the Moscow Department of Justice as "Moscow's Aum Religious Association." Aum also registered a "Committee for the Defense of Freedom" at this time. It is this defense committee that fought the parents' group three year fight against the Aum, according to Russian and Japanese press reports.

Following the subway attack, activities against the Aum in Russia intensified. By mid-April 1995, President Yeltsin publicly ordered Russia's Prosecutor General, the Federal Security Service, and the Commission for Religious Organizations in the Russian government to thoroughly investigate the Aum. In response to this edict, Russian press reports indicate that the Russian court that had been hearing the parents' lawsuit against the Aum banned all of the Aum's activities in Russia. The court charged that the Aum was harming Russia's young people and criticized Mayak Radio and the Russian television station for allowing Aum propaganda on its airwaves. The Aum was ordered to pay 20 billion rubles (4 million dollars) to the defendants and it lost its registration as an official religion. The group was also banned from further television and radio broadcasting. Despite these actions, an Aum official in Moscow said:

> ". . . Aum will not cease to exist in Russia. We shall continue to exist in other forms, but we shall prevail by all means."

According to Russian press reports, in June of 1995 the parent group that had originally initiated the court case against the Aum, charged that the Aum continued to operate underground. By July 1995, the Russian press stated that Russian authorities began arresting Aum members. In early July, Russian authorities detained the leader of the Tatarstan branch of the Aum. The leader there told Russian reporters that his branch had 200 followers. On July 21, 1995, Russian law enforcement officials arrested one of the leaders of the Russian branch of the sect, Outi Toshiyatsu, who is a Japanese citizen. Russian authorities charged Toshiyatsu with organizing groups that infringe on citizens' rights and with causing material damage by cheating or breaching confidence. There has been no trial yet.

The press as well as the parent's organization opposed to the Aum, have publicly criticized the inaction of Russian authorities in closing the Aum headquarters in Moscow following the court's decree. According to their allegations, only one of the Aum's seven centers was closed immediately. In that center, reporters claim that authorities found "powders and unpackaged tablets." Russian press reports claim that Russian officials did not move to close the remaining centers until at least a week after the court order to close the Aum premises and that by then, those centers were completely emptied, all their contents having been removed.

2. *Arming With Russian Weapons*

It is clear that the Aum was interested in the technology and weapons that are available in Russia. The major proponent of the sect's expansion into Russia was the Aum's Construction Minister Kiyohide Hayakawa. He was also the mastermind of the Aum's attempts to arm itself, according to Japanese officials and cult documents.

In total, Hayakawa visited Russia 21 times from 1992–1995, spending a total of 180 days there. The first recorded visit took place from January 11–20, 1992. He visited three other times before mid-March of that year—presumably paving the way for Asahara's late March visit. From November 1993 to April 1994, Hayakawa visited Russia regularly between one and two times a month. Hayakawa was in Russia from March 17–22 of this year during the sarin attack in Tokyo. He said that he was there to learn about the judiciary system and to renew broadcasting contracts.

The Staff believes that Hayakawa played a key role in obtaining technology and weapons from Russia. Hayakawa helped to purchase a Soviet-made MI–17 helicopter and invited Russian engineers to Japan to help train sect members to maintain the helicopter, according to official Japanese documents.

According to a Japanese Diet member who was giving a report to the Japanese legislature, the helicopter was built in Tatarstan. The Japanese official states that Russian law enforcement authorities were conducting a probe into an alleged bribe of a former Russian parliamentarian in connection with the purchase of the helicopter, according to the Japanese press. The Diet member said that the former Russian parliamentarian allegedly helped expedite the acquisition through Azerbaijan and that the Russian lawmaker under investigation is from the Caucasus and has great influence in that region.

The Staff has confirmed that the helicopter passed through Japanese Customs in 1994 via Azerbaijan Air and that the Aum subsequently inquired about certification for a larger MI–26 helicopter and requirements to fly an MI–26 to Japan from Russia. As indicated in section VI(C), *infra*, Aum members received helicopter training in the United States in late 1993.

Japanese police sources also allege that Hayakawa brought pistol models to Japan from Russia in the Spring of 1994 in order to produce the pistols in Japan, according to press reports. These sources also claim that documents seized from Hayakawa upon his arrest included blueprints for the Soviet Kalashnikov assault rifle.

There are many allegations that Aum members may have received military training in Russia.

- Official Japanese documents and press reports state that a tourist brochure printed by Devenir Millionaire, an Aum-affiliated travel company located in Tokyo, described a tour of Russia that included shooting exercises at Russian military facilities. The brochure claimed that the exercises were performed under the supervision of former Spetznaz members of the Russian armed forces.
- Press reports claim that Aum Defense Ministry leader Kibe and Secret Unit member Masaq Furukawa underwent comprehensive pilot training in Russia. The Aum paid Russian instructors at Moscow's "Airfield Number 3" $15,000 each for a rigorous training course. Furukawa was in charge of planning military training in Russia under a special Russian unit. As indicated elsewhere in this statement, the Staff has confirmed that Kibe did receive helicopter training in South Florida in late 1993.
- Documents seized from Hayakawa contained the following schedule for military training:

  Regulation program—$2,800 to military
  1st Day—tank armored vehicle ride inside
  2nd Day—various guns, rocket cannon, machine gun
  3rd Day—rifle machine gun
  4th Day—rest
- A senior Japanese police officer told the Japanese press that Hayakawa's documents stated, "If expenses are paid, government will grant approval."

Russian Defense Ministry officials have denied that any training took place at official facilities. In contrast, the Staff found the following Russian and Japanese press reports:

- Russian military sources told Japanese reporters that Asahara inspected a military base near Moscow in the summer of 1993, but stated that no training took place at that time. Together with a number of followers, he met military officials there for talks, and inspected the grounds. The officials pointed out that not only Asahara and his followers but many other foreigners were also given access to the base.

- A Russian diplomatic source told Russian reporters that, "for many the military is letting in outsiders regardless of whether they are visiting officially or on a private trip."
- A staff member of the Interior Ministry also publicly claimed that the Ministry would not participate in such training but that militants of any rich organization could have used training bases of private security bodies.

The Chief of Staff of the Far Eastern Military District of Russia has publicly denied rumors that Aum members were trained as pilots at his base but admitted that there are many private firms and air companies with helicopters at their disposal. The spokesman opined that one of these firms or a pilots' club may have trained the sect members. He noted that in 1993 the local press published a report concerning the death of a Japanese tourist in the crash of a helicopter belonging to a private company.

In addition to obtaining conventional arms and training, the Aum apparently saw Russia as a source for more exotic, and far more deadly, weapons. At the time of his arrest, Hayakawa had information about a gas laser weapon. His documents referred to the name of a Russian city where "there is a weapons market" and noted its distance from Moscow, according to Japanese press.

Hayakawa's documents also indicated that the sect was interested in obtaining a space-launch rocket, according to the Japanese press. According to press accounts, Japanese officials said that the documents include a reference to a Russian Proton rocket and reference its prices and the need to build a base in Japan. The Proton rocket is capable of carrying a satellite. The press has speculated that Russia's Khunichev Space Center, which is the designer and producer of the TOPOL rocket, had some sort of relationship with the Aum. Recently, however, the public relations office of the Center announced that the Center has never had any contact with the sect.

The Aum's interests apparently extended to the most devastating of weapons. There are references in the documents seized from Hayakawa to the desired purchase of nuclear weapons. The documents contain the question "how much is a nuclear warhead?" and lists several prices. It is unclear whether the references are reflections of actual discussions or negotiations.

3. *Allegations of Influence In Russia*

Much has been written in the press about the relationship between the Aum and officials of the Russian government. Most of these allegations have been denied, in whole or in part, by the officials in question. Little has actually been confirmed by U.S. or Japanese government officials.

The following are some of the allegations made by Russian and Japanese press reports:

- That Asahara led a delegation of 300 Aum members to Russia in March 1992. During that trip, Asahara met with Parliament Vice President Aleksandr Rutskoy and former Russian parliament speaker Ruslan Khasbulatov.
- That Russian parliamentarian Vitaliy Savitsky, chairman of the Duma's Religious Affairs Committee told fellow parliamentarians that, "his committee seriously suspected that Aum Shinrikyo had been assisted in its penetration into Russia by Russian intelligence services."
- That the premier nuclear research facility in Russia, the Kurchatov Institute, had Aum followers as employees.
- That during 1992–93 Aum leaders visiting Russia approached Russian science officials to seek laser and nuclear technologies and that Shoko Asahara met Nikolay Basov while Asahara was in Moscow in 1992. Basov is a 1964 Nobel prize winner for his research on the principle of laser technology.
- That Secretary of the Russian Security Council, Oleg Lobov, received anywhere from $500,000 to even $100 million from the Aum. This relationship started in December 1991 and continued through 1995.
- That a Russian known to be a secretary of Lobov's sent facsimiles to Hayakawa in Japan and that Hayakawa visited Lobov during his visits to Russia throughout the 1992–1995 time period.
- That no one from Moscow asked Russian Embassy officials to check out the Aum and that Lobov met with Aum officials on his own, without informing the Embassy or asking its advice. The sources said that the February 1992 meeting was agreed to without the participation of the Russian Foreign Ministry or in-

telligence services prior to Lobov's trip to Japan. No leading Embassy staffers were present at the meeting.

All of the officials have denied allegations that they helped the Aum. The Staff has discovered photographs that appeared in Aum publications purporting to be Rutskoy, Khasbulatov, Basov, and Lobov with Aum leader Asahara. Furthermore, in a press statement quoted on page one of the March 30, 1995, Russian language edition of *Mowcow Izvetsiya*, Lobov admit to meeting with Aum officials but states that he was duped by them due to his "charitable nature" and neither the Russian Ministry of Foreign Affairs nor the Russian intelligence service warned him away from them.

The Staff has reviewed an official Japanese document that corroborate limited aspects of the above allegations. The document states:

- In Fall 1991, Aum Shinrikyo gave a message promising aid to Russia, to a Russian business person in Tokyo who had been asking many organizations for such aid.
- In December 1991, this business person visited Russia with Hayakawa, then the cult's administration director, and met with Mr. Lobov, the President of Russian-Japan College, present Russian Secretary of Security Council, Mr. Muravjbv, the Secretary General, and Mr. Khushchov, the Chairman of the Board of Trustees.
- In February 1992, Mr. Lobov was invited to Japan by Nissho-Iwai Co., Ltd, and met with Asahara.
- In March 1992, by chartering an Aeroflot aircraft, a delegation of 300 cult followers headed by Asahara visited Russia and met with Rutskoy, Khasbulatov, and Lobov.

In addition, the Staff has been able to confirm, through a visit to the Kurchatov Institute, that an employee of the Institute was, and still is, a member of the Aum. The nature of any of the relationships alleged above, if indeed a relationship existed, remains unconfirmed.

4. *The Aum In Other CIS States*

The Aum attempted to open offices in other states of the former Soviet Union. The Staff has confirmed that there are some Aum disciples in Kiev, Ukraine. They petitioned government officials in Kiev to recognize the Aum as an official religious group in September 1993. The Ukrainian government ignored the request. The request included the names of ten Ukrainians from Kiev who claimed that they were Aum members.

In December 1993, the Aum petitioned for recognition in Belarus. In Belarus, the capital city officials rejected the request to open an Aum branch and banned Aum from using radio facilities to air religious messages.

B. The Aum Shinrikyo in Australia

The Aum's most intriguing presence may be in Australia. The Staff has confirmed that the Aum was in Australia from April 1993 to October 1994. From documents provided to the Staff by the Australian Federal Police, the Staff determined the cult purchased a 500,000 acre sheep farm in Banjawarn, Australia located approximately 375 miles northeast of Perth, Western Australia's state capital. In order to purchase this farm, the cult formed a front company named Clarity Investments, Ltd. in May 1993 and another company, Maha Posya Australia, Ltd. in June 1993. Maha Posya was also used to import electrical equipment including transformers, static converters, generators, co-axial cabling, batteries, meters and tools and protective equipment into Australia in September 1993.

The Australian Federal Police gave the Staff documents confirming that in April 1993, three members of Aum Shinrikyo arrived in Perth from Tokyo. The three included Construction Minister Kiyohide Hayakawa, who was also the person instrumental in setting up the Aum's operations in Russia, and Intelligence Minister Yoshihiro Inoue. They hired an Australian citizen of Japanese heritage who was a real estate agent based in Perth, to view remote farming properties in Western Australia which were then for sale. They were evasive with the agent about their specific requirements; however, it became apparent that they were looking for a remote area with arid conditions. The group indicated that they wanted to inspect properties where they could conduct experiments of benefit to humankind.

The group was flown to several properties in the period April 23–26. After landing at each station, they went off by themselves for some hours. While inspecting these properties, they conducted unknown experiments utilizing a laptop computer, attachments, and electrodes which were placed in the ground. Hayakawa and another of the Aum leaders in the threesome may have also traveled to Tasmania and an area in South Australia where a large uranium deposit is located.

Ultimately, the group decided on the property in Banjawarn, an area where there is a known uranium deposit. In April 1993, Hayakawa allegedly offered to purchase Banjawarn Station for cash; however, the offer was refused by the owner. Following this refusal, the Aum formed Clarity Investments and Maha Posya Australia. These companies were created for the claimed purpose of applying for mining and exploration leases. In June 1993, the Aum used Maha Posya as a front company to purchase Banjawarn Station for approximately $400,000. Asahara and Yasuko Shimada, an Australian citizen of Japanese descent and sect member were named as directors of each company.

Hayakawa contacted a consulting geologist after learning that Banjawarn Station is a pastoral lease, meaning that other individuals could enter the property for the purpose of prospecting for minerals. Hayakawa did not want any unauthorized person to enter Banjawarn Station. It is unclear if he succeeded in having the lease changed; however, the Aum did purchase eight mining leases from the Western Australia Department of Minerals and Energy in September 1993 for approximately $4700 each.

The Staff has confirmed that at about this same time Hayakawa and another cult member, Tsuyoshi Maki, applied for tourist visas at the Australian Embassy in Tokyo. Hayakawa and Maki arrived in Perth on September 3, 1993. Shortly after arriving in Australia, they met with their consulting geologist. During that meeting they told the geologist that they wished to obtain a ship and inquired of her what price they could expect to pay. They also mentioned at the meeting that they wanted to export the uranium ore from Banjawarn Station in 44 gallon drums.

During the following week, Hayakawa and Maki engaged an Australian travel agent to make arrangements for six four-wheel drive vehicles and a chartered aircraft. The Staff has confirmed that at the end of that week cult leader Shoko Asahara arrived in Perth with 24 followers from Japan, including five females under the age of fifteen who were traveling without their parents. Also in the group were Hideo Murai, the sect's Science & Technology Minister; Niimi Tomomitsu, the Home Affairs Minister; and Inoue. The Aum group traveled with chemicals and mining equipment on which they paid over $20,000 in excess baggage fees. According to the Australian Federal Police report, among the baggage was a mechanical ditch digger, picks, petrol generators, gas masks, respirators, and shovels. A Customs duty of over $15,000 was paid to import these items.

Because of the large amount of excess baggage being brought in by the group, Australian Customs searched the entire group. This search revealed four liters of concentrated hydrochloric acid, including some in containers marked as hand soap. Among the other chemicals that Australian customs officials found were ammonium chloride, sodium sulphate, perchloric acid, and ammonium water. All of the chemicals and some of the laboratory equipment were seized by Australian authorities.

As a result of the search, two Aum members—Seichi Endo, a biochemist and Minister of Health & Welfare for the Aum; and Tomomasa Nakagawa, a medical—were charged with carrying dangerous goods on an aircraft. The two members subsequently appeared in Australian court, pleaded guilty, and were fined about $1,750 each. The two claimed that the acid was for gold mining. These same two individuals were later arrested by Japanese authorities in connection with the Tokyo subway attack.

Australian authorities believe that the cult planned the logistics for transporting their goods to Banjawarn Station well in advance of the trip. They chartered three aircrafts and, having lost their chemicals to Australian authorities, the Aum used their real estate agent and their geologist, both of whom were Australian citizens, to obtain new chemicals for them from chemical wholesalers. These chemicals were obtained either in the name of Maha Posya or in the name of the real estate agent's company. All payments for the chemicals were made in cash. The Aum apparently went to great lengths to obtain these chemicals, including flying one of their members over 4,000 miles from Perth to Melbourne to obtain two 25 gram bottles of a chemical unavailable in Perth. The two bottles cost the Aum a total of $136—in order to obtain them, the Aum spent over $800 in airfare.

The Aum also tried to hire earthmoving equipment from a mining operation at an adjoining station. The mine operators refused to lend the equipment without a mine worker to operate it to which the Aum did not agree. A backhoe was hired by the Aum without an operator from a rental company for three days, September 16–18, 1993. Digging and evidence of earthmoving equipment has been found on the property.

The Aum also established a laboratory on the Banjawarn property which was stocked with computers and various digital and laboratory equipment. The door of the laboratory was marked with Japanese characters and an English subtitle which read "Toyoda Laboratory." This may be a reference to a Toru Toyoda, a sect member who arrived in Australia with Asahara. Witnesses told Australian Federal Police that the laboratory contained laptop computers, digital equipment, glass tubing, glass evaporators, beakers, bunsen burners, and ceramic grinding and mixing bowls. There were limestone or calcrete type rocks on the floor. Other equipment included a small laboratory-size rock crushing machine and two small generators.

The Staff has confirmed from Australian authorities that most of the sect members who are Japanese citizens left Australia by 4 October 1994. In October 1993 Asahara and four of the original group applied for tourist visas to return to Australia; however, acting on information provided by Australian Federal Police, the immigration department refused them visas, along with visas for twelve other Aum members. Asahara petitioned his visa denial with a letter to the Australian Federal Minister for Immigration. In the letter he said he was blind and needed the help of 2 aids. Also, because his life was under threat, he said he needed 17 bodyguards to accompany him on his trip to Australia. He said that his Tokyo headquarters had been sprayed with diluted harmful gas and that during trips to Russia he had received bomb threats.

In late October 1993, two other Aum members did obtain visas. These two arrived in Perth on October 30, 1993 and stayed at Banjawarn Station until April 1994. While there, one of the Aum members petitioned the Western Australian Pastoral Board to de-stock Banjawarn station of its sheep. This petition was denied. Inspections by Western Australian Pasostral Board members revealed that several wells were either fouled or not operating and the Board called for an Australian manager to be hired for the property or the lease would be revoked.

The sect members did hire a manager. While at the property, the manager says that the two sect members maintained constant contact with their superiors in Japan, with instructions being received by fax or telephone. The manager did not witness any experiments or mineral exploration. The equipment and chemicals inside the laboratory were removed about March or April 1994 to accommodate sheep-shearing teams. The Aum members insisted that either the sheep not be shorn or that they be shorn by others who would be flown in from Japan. Approximately 2,000 sheep were subsequently sold to a slaughterhouse shortly after shearing.

On April 28, 1994 these two cult members returned to Japan. They were replaced by an Aum member who is an Australian citizen and Tsuyoshi Maki, a Japanese citizen who had been part of the Aum's original advance team.

Shortly after the sarin gas attack in Matsumoto in June 1994, Banjawarn Station was offered for sale by Maha Posya. Maki handled the details of the sale and seemed anxious that the sale proceed quickly. The property was sold in late July 1994 for $237,000, almost $165,000 less than what the Aum had paid for it only a year earlier.

The Aum's activity on the property is partially known and, to some degree, still a mystery. Various police sources indicate that Hayakawa was interested in extracting uranium from Australia for the development of nuclear weapons. Documents seized from Hayakawa include some ten pages written during Hayakawa's April-May 1993 visit to Australia which refer to the whereabouts of properties of uranium in Australia, including one reference praising the quality of the uranium in the state of South Australia. Australia is one of the world's leading exporters of uranium ore.

It appears, however, that the Aum was interested in more than just mining on the Banjawarn property. The Chairwoman for the aboriginal community living near the sheep station, Phyllis Thomas, said that she and other Aborigines saw about five people wearing full-length suits and helmets on the remote site in late August 1993. The suited sect members were standing by a twin engine airplane and others were in the plane.

In March 1995, shortly after the Tokyo subway attack, the Australian police were invited to the sheep station by its new owners who had found papers with Japanese writing and various chemicals. The chemicals that police found could have been used for mineral processing or to make an irritant gas. They included perchloric acid, nitric acid, ferric chloride, ammonia solution, hydrochloric acid, chloroform, potassium dichromate, and other unidentified solutions.

The Staff has confirmed that these chemicals are almost identical to the chemicals carried on board the aircraft by Asahara and his people when they flew to Perth in 1993. Only 2–3 liters of each chemical was found in an outhouse which bore a sign saying "Laboratory," while larger quantities were located in a portable building. Although the Aum members had originally stated that the chemicals they sought to bring into Australia were for the purposes of gold mining, there was no evidence of gold mining having been carried out.

The current owners of the property have stated that the Japanese occupants had a number of gas masks in their possession but that they took them when they left. One gas mask was left behind and seized by Australian police. Paper dust masks were also located in a plastic bag bearing Japanese writing.

The Staff has confirmed that the Aum conducted experiments with sarin on sheep at its property in Banjawarn. The Australian Justice Minister, Duncan Kerr said that members of the Aum tested sarin in Australia before the Tokyo subway attack. He said that tests on wool and soil samples taken from the Banjawarn station had confirmed traces of the chemical. Kerr said that sarin residue had been found in and near a group of about 29 dead sheep on the station. Specifically, traces of the acid that results when sarin breaks down was found in the soil and in the wool of the sheep found in the area.

In addition, authorities found a document written in Japanese and titled "Banjawarn Station." This document suggested the sect may have been experimenting on sheep. The document contained notations for classifying dead or injured sheep by using unique Japanese markings. Australian Federal Police have also confirmed that some of the sheep were killed with blunt force to the head.

C. The Aum Shinrikyo in the United States

The Aum Shinrikyo came to the United States officially in late 1987 when it incorporated in New York City under the name Aum USA Company, Ltd., a not-for-profit corporation. Although the office purported to promote the cult's book sales and recruitment of followers, the Staff's review of records and documents, and interviews of the manager of the New York office, establish that the office was also acting as a purchasing agent for the cult as it attempted to obtain high technology equipment, computer software and hardware, and other items from the United States, much of which was intended to assist the cult's militarization program. Additionally, in the 1990's the cult utilized a purchasing agent in California to facilitate acquisition of similar technology and hardware, and military equipment such as gas masks.

The total extent of the Aum's efforts to obtain equipment and technology in the United States is not known. As indicated in this section, some of the items sought by the Aum were not delivered because U.S. company representatives were suspicious of the Aum and its purported end-use of the product. This is a good example of self-policing by the private sector and efforts to sensitize industry to their responsibility should be promoted. Other purchases appear to have been preempted only by the Aum's March 20th attack which gave notice to all of their criminal intentions. And, in certain instances, the Aum was simply able to access technology whose use is still unaccounted for. Although the Staff is aware that U.S. government agencies are investigating this activity, ultimately, we will never know how successful the Aum was in its efforts to militarize in the U.S.

1. *New York City Office*

According to corporate records, the New York City office was initially organized by Fumihiro Joyu, who claimed his address at 53 Crosby Street in New York. At various times it was staffed by different personnel including Yumiko Hiraoka, Yasua Hiramatsu, Masuru Jingo, Isao Yamamoto and others. From 1988 through the present the cult also maintained a small office at 8 East 48th Street, #2E; 242 East 87 Apt 5d; 8 East 48th Street Apt. 4f.

The articles of incorporation were amended in 1988 and at that time Chisuo Matsumoto appeared as Director of the corporation. Chisuo Matsumoto is the lay name of Asahara. The articles established the Aum as a tax exempt organization. That same year, Joyu, as Treasurer/Director registered Aum USA as a charity in New York. In the section of the application requesting a description of the organization, Joyu wrote:

> "AUM U.S.A. Co. Ltd. is a non profit religious organization. The purposes for which the corporation is formed are to foster spiritual development through the study and practice of eastern philosophy and religion to encourage means for extending awareness(sic), such as meditation, seminars, classes, workshops, to offer nutritional information and exercises which will further the development of spiritual well-being."

In the early 1990's corporate documents of the Aum and tax records indicated that Yumiko Hiraoka became the primary manager of the Aum's New York office where all office related documents (bills, ledgers, accounts, tax records) were in her name.

Hiraoka describes herself as a nun and sect leader of the New York branch of the cult. She indicated she is in her early 40's, although she is unable to be more exact as she measures her age in "monk" years. Based upon observations made by the Staff during interviews with her, she clearly is still a devotee of Asahara.

The Staff has reviewed the business records of the cult's New York office provided by Hiraoka pursuant to subpoena. It should be noted that the records provided may not reflect all of the cult's activities. According to Hiraoka, in late March 1995, within days after the subway attack in Tokyo, Hiramatsu appeared at the New York office and took numerous records of the cult's transactions back to Japan.

There is substantial documentation of efforts by Hiraoka and her staff to sell dozens of books published by the Aum such as *Is Aum Shinrikyo Insane?, The Secret Method to Develop Your Superhuman Power, The Doom's Day,* and *Curable High Blood Pressure.* A review of the records provided, however, establishes that the cult in the years preceding the attack sold less than 100 books per year. During this same time period, despite a claim of aggressive recruitment by Hiraoka, the cult maintained an active membership of less than a few dozen devotees in the New York area. Some governmental sources estimate that the number was much higher, closer to 200. There is no evidence to support the higher number. There was also an Aum member in Colorado, according to Hiraoka, who was in regular contact with the New York office and translated Asahara's work into English.

A review of the telephone records reflects very substantial telephone communications both internationally to Japan and elsewhere including Canada, Germany, Russia, United Kingdom, Taiwan, Israel, Australia, Sri Lanka, Ghana and Nigeria, and domestically within the United States. As expected, there was substantial telephone activity in the days following the March 20, 1995 subway attack.

Interestingly, in the days following the subway attack, the New York office of the cult recognized it had a substantial public relations problem. It transmitted the following message to numerous "experts" or "would-be experts":

> "To Whom It May Concern: The Independent Research Committee for the Tokyo Subway Gas Attack urgently needs a group of impartial specialists from various fields. Please read the following guidelines and call (212) 421–3687 if interested in this investigation. We will greatly appreciate your cooperation."

Telephone records also support substantial contacts with news media outlets.

The Staff's investigation further reflects that the cult's New York office was actively involved in the procurement and attempted procurement of high technology items with possible military use. Though most of the documents at the Aum's headquarters were taken by the cult after the Tokyo incident, entries in the Aum's ledger reflect various payments to technology and laser companies. The cult utilized various corporate entities to facilities these transactions including its primary alter ego, Aum USA Company Ltd., and the company Maha Posya.

In documents received from Hiraoka the above entities claim the cult's New York offices as their corporate headquarters or their New York office. Both Aum USA and Maha Posya have Chisuo Matsumoto (a/k/a Asahara) as their director. Further, other directors and officers of these corporations are Aum members. Undoubtedly, based upon the above, it is clear that these corporations were alter egos of the cult itself wholly controlled by the cult and intended to conduct the cult's business.

Through these companies and the efforts of its agents including Hiraoka, Hiramatsu and others, the Aum negotiated for purchase of various items.

2. *High Tech Acquisitions*

In August 1993, the cult attempted to obtain a Mark IVxp Interforometer from the *Zygo Corporation* in Middlefield, Connecticut. The Mark IVxp is a laser measuring system primarily used for measuring lens systems, optical components and flat and spherical surfaces. A dual commercial/military use item, the system has numerous applications including the measuring of plutonium. The U.S. Commerce Department prohibits the export of this machine to certain countries including Libya, Iran, North Korea and Cuba.

In August of 1993, representatives of Zygo received contacts from the Aum, including telefaxes from Hiraoka. On August 23, Zygo issued a price quotation for the Mark IVxp system at $102,777.96. Additionally, the Aum requested a vibration isolation table which with modest reconfiguration can be used to measure spherical surfaces including plutonium used in nuclear weapons.

Ultimately, the Aum did not receive the system. According to Zygo, the transaction was never consummated because Zygo became suspicious of the transaction and contacted export licensing authorities.

In 1994, the Aum completed two sales transactions with *Lydall Technical Paper* of Rochester, New Hampshire, totaling approximately $32,000, for HEPA media, which is an air filtration media. This media, which is roll goods, is utilized for air filtration in "clean rooms." The Staff would note that the Aum constructed "clean rooms" at their compounds in Tokyo in facilitate the handling and production of sarin and other chemical and biological weapons.

In January 1995, the Aum purchased molecular modeling software from *Cache Scientific* of Beaverton, Oregon. According to representatives with Cache, the entire contact with the Aum consisted of a telephone call requesting literature, a sales order and a shipment. The shipment cost approximately $2995.00. The software purchased was the most basic in their product line, consisting of a manual and computer diskettes.

According to Cache representatives, their product enables a chemist to synthesize molecular experimentation on a computer screen instead of in a laboratory, which results in savings of time and money. He also stated that downloads from other databanks (i.e., Brookhaven's Protein Data Bank) could be ported into Cache programs for analysis and data modeling.

In a similar effort, Hiramatsu, on behalf of the Aum, contacted *Biosym Technologies, Incorporated*, also a molecular design software company, located in San Diego. During February and March of 1995, Hiramatsu negotiated with Biosym for the purchase of a sophisticated computer hardware system and over twenty different software programs. Hiramatsu purchased the hardware for $47,000 and agreed to a thirty day evaluation period for the software products. Additionally, Biosym uploaded approximately twenty samples (out of 200–300 available) from the Brookhaven Protein Data Bank. According to the company, they are a licensee of Brookhaven Laboratories and are authorized to distribute information from the data bank.

Following the Tokyo gas attack, the computer hardware was returned to Biosym but the disk drive containing the software was missing. Allegedly, this disk drive was taken to Japan. The drive was later returned to Biosym by the Aum but it is unknown if the sect was able to download the information it contained. There were protections on the software to prevent such unauthorized removal.

The software, as in the case with other company's products sought by the Aum, is used to model molecular structures during scientific and medical research. Experts told the Staff that the Aum could use such advanced software to assist them in testing theoretical designs for toxins. It should be noted that this software is covered by export restrictions to countries such as China. The fact that Japan is not among the countries included in such restrictions demonstrate that sub-national groups located in non-restricted countries, and who are engaged in development of sophisticated weapons, are not affected by export restrictions.

In the weeks and days preceding the March 20, 1995, Tokyo subway attack, the Aum attempted to purchase a half million dollar laser system from the California manufacturing company, *Hobart Laser Products* of Livermore, California.

In March, 1995, Hiramtsu, contacted sales and technical representatives of Hobart. Hobart manufactures extremely sophisticated lasers for industrial and scientific applications involving cutting and welding. According to the company, for approximately two weeks leading up to March 18, 1995, the Aum negotiated for the purchase of a three kilowatt Laser Welder with installation support. The system costs approximately $450,000.

The Hobbart personnel were confused by the Aum's intended end use for the machine so they contacted Yasuo Murai, the Aum's Minister of Science & Technology in Japan. In their contact with Murai and in a subsequent meeting with Hobart representatives on March 8 in the United States, Hobart representatives attempted, to no avail, to determine the intended usage of the equipment.

From the discussions with Hiramtsu and Murai, the operating parameter set forth by Murai, allowed Hobart to draw the following technical conclusions:

- The Aum wanted the laser to be operable from within a glove box, a sealed room environment, outside of which the operator could manipulate the equipment through the usage of thick gloves. Experts have advised the staff that this is particularly useful if biologic toxins, aerobic or contact poisons, or nuclear emissions are of concern.
- Murai indicated the laser would be used to weld aluminum oxide (AIOx). The welding was to be of canisters, and perhaps canisters within canisters. AIOx is highly resistant to chemical corrosion, even more so than stainless steel, and the welder can operate with liquid nitrogen as a coolant. It is also extremely strong and can withstand high pressure. Aum had allegedly stockpiled large amounts of sheet AIOx for this purpose.
- Of primary concern to Hiramatsu and Murai was the rapid delivery of this expensive laser. Hobart representatives were told that it was required immediately and cash was available. This request was impossible: The laser is custom built, after receipt of the order it would probably would take several weeks to months to complete and ship. Hobart told the Staff that there are also serious export control requirements.

Hobart's representative also told the Staff that he learned that Hiramatsu was buying up antiquated chip manufacturing equipment and stockpiling same in California for shipment to a front company in Silicon Valley. The Staff has been advised by various U.S. governmental sources that they theorize the cult intended to use this equipment to fill sham computer-manufacturing shops in Japan or Taiwan. These sources indicate that these companies would then be used to justify the importation and usage of chemicals such as arsenide, chlorides and fluorides, which can be obtained in the wafer and chip-etching business but are more realistically used by the Aum for the manufacture of toxic nerve and blood gases.

In March of 1995, Yasuo Hiramatsu contacted *Tripos, Incorporated* of St Louis, Missouri. The company specializes in molecular design software. This software is used by highly trained physicists and chemists to develop new therapeutic drugs in the pre-clinical design phase. It can also be used to research and develop biological toxins. According to the company's Chief Executive Officer, people without extensive experience in this area would have difficulty in using and applying the software.

According to Tripos sales personnel, Tripos was suspicious of Hiramatsu's motives regarding the purchase of their software from early on. Hiramatsu first contacted the New Jersey office of Tripos from California on March 3, 1995. During the course of their contacts with Hiramatsu, he consistently refused to provide detailed information on either the company (Aum) or the intended use for the software.

Tripos installed all the available "modules" of their software on a computer workstation provided by the Aum. The software had keyword protection and was timed to expire thirty days after installation. Following the revelation that the Aum was suspected in the Tokyo gas attack, Tripos attempted to retrieve the software. The disk drive containing the software was intercepted by U.S. law enforcement personnel in a shipment outward bound to Tokyo from California. While the software did have keyword protection, this could have easily been bypassed. The thirty day expiration protection could also be avoided by turning back the internal clock on the computer in which it is installed. The total worth of the software was over $507,000.

The last contact Tripos had with Hiramatsu was on March 21, 1995, the day after the Tokyo gas attack. The CEO of Tripos told the Staff that the software could be used to determine if a scientific configuration was feasible but would only be the first step in development. He stated that biological toxins are relatively simple and the software was much more sophisticated than what would be needed to develop toxins.

3. *West Coast Activities*

Beginning in June 1994, the Aum established a relationship with a purchasing agent on the West Coast to assist it in obtaining military technology and hardware. The company, *International Computers and Peripherals* ("ICP") was a U.S. business in California formed to export computer parts to Japan. The partners in the venture, Phillip Rupani, Cameron Hader and Kevin Singh (a/k/a Kevin Guneja), sought Japanese companies as potential clients. In June, 1994, the Aum, organized as Maha Posya, engaged ICP as an export agent.

Through telefax, telephone, and personal contacts, ICP developed a business relationship with Hiramtsu and Tsuyoshi Maki and began to obtain computer parts presumably for the Aum's computer stores in Japan. The Staff has interviewed principals with ICP and reviewed their records. ICP estimates that their business with the Aum exceeded a few million dollars by the end of 1994. However, near the end of 1994, Hiramatsu began to make requests for other items. Initially, Hiramatsu wanted to obtain thousands of "serum" bottles, hundreds of mechanical fans and equal amounts of camcorder batteries. Later, Hiramtsu began to inquire about obtaining laser equipment, survival equipment and similar items. At one point, Hiramatsu asked whether ICP knew how to obtain "arms," a plane, and "container ships." Hiramatsu told Rupani the arms were for a customer in the Middle East.

ICP told Aum representatives they could not obtain these items but directed him to the U.S. Chamber of Commerce.

In January 1995, the Staff has learned that Maki and Hiramatsu began to seek military equipment from sources in the United States. In late January 1995, Maki attended a Winter Market Show at the Reno Convention Center in Nevada at which time he made contact with a representative of *Rothco*, a company from Smithtown, NY. Maki inquired about survival equipment and expressed an interest in obtaining gas masks.

A week after the January 1995 meeting, Rothco, through telefax received a request from Devenir Millionaire, Inc., another Aum company, wherein Maki requested various items including 200 military style knives, and various types of gas masks. In February, Maki requested Rothco change the purchaser to Maha Posya Inc. because it would make it easier to clear Customs.

After receiving a $1,906.00 wire transfer to their account, Rothco sent samples of the requested items to Japan. In the shipment were a Russian and Japanese gas mask. Rothco shipped these items without applying for or obtaining a State Department license which is required. The following month, Rothco received a request for 400 of the same gas masks with filters and its account in New York City was credited with an additional $3,195.00. Maki, however, requested that Rothco send the gas masks to ICP of Freemont, California, who would act as a freight consolidator.

ICP received the items after Hiramatsu indicated that the Aum wanted to consolidate the items it had obtained in the United States. Various containers were forwarded to ICP, including boxes from Rothco. ICP, through a freight forwarder, started the process of sending the items to Japan in March of 1995.

On March 22, 1995, two days after the Tokyo attack, a source from Japan contacted ICP in California, and told company representatives that he should stop selling to Maha Posya because they were killing people in Japan. At this time, Rupani recalled the Maha Posya shipment from the freight forwarder and returned it to ICP in Freemont, California. Rupani looked in the shipment and discovered it included the gas masks.

4. *Helicopter Training in Florida*

In 1993, two Japanese followers of the cult visited the United States to obtain pilot licenses for private helicopters. In October of 1993, members of the Aum came to Dade County, Florida and received flight lessons from *Kimura, International*, a private flight School in Opa Locka, Florida. The two were Aum Defense Agency Director, Tetsuya Kibe, and Aum member Keiji Tanimura. They both had U.S. social security numbers and airman class 3 certificate numbers. They received a private pilot rating for rotor craft-helicopters on October 31, 1993. Soon after receipt of their licenses, the cult obtained the helicopter from Russia

D. The Aum Shinrikyo in Other Countries

In addition to its efforts to recruit members and obtain and test weapons and technology in Russia, the Aum also established a presence and/or undertook activities in a number of other countries, including Germany, Taiwan, Sri Lanka and the former Yugoslavia. Some of these countries appear to have been used for recruitment purposes, while others appear to have been used for the establishment of purchasing companies or other businesses. In at least one country it appears the Aum attempted to obtain scientific information.

1. *Germany*

In January 1989, the Aum rented an 825 square foot office in Bonn, Germany for 6,000 DeutscheMark per month. The office was ostensibly rented for administrative and cultural purposes. A woman named Yoko Shigimara-Haltod, a resident of Bonn, signed the lease and paid the monthly rent. Two telephone numbers are listed for the office in the name of Naruhito Noda; however, no one by that name is listed in the Bonn Population Office.

In June 1991, the Aum sent a letter to the German Embassy in Tokyo requesting permission to send one of its members, Akira Wakatake, to reside in Germany for three years. According to the letter, Wakatake had been a member of the Aum since 1986 and was a teacher of meditation techniques and yoga. The letter stated that the Aum would be responsible for any costs arising during Wakatake's stay in Germany, as well as for his personal conduct while in Germany.

Wakatake entered Germany in February 1992. A sign on the Aum office thereafter read "A. Wakatake Buddhismus und Yoga Center Aum." After several language courses at the Goethe Institute, Watatake was granted a trading license by Bonn city authorities in July 1993 which enabled him, in addition to his occupation as a teacher, to sell books and cassettes of the Aum.

The Aum was not very successful in recruiting members in Germany. According to press statements made by Wakatake, ten German nationals—but no other Japanese—were members of the Bonn branch of the Aum. At least one member, a French national named Pauline Silbermann-Hashimoto who is married to a Japanese citizen, resided in Munich. It is unclear whether the Bonn office was used for anything other than recruitment efforts; however, on March 21, 1995, the day after the Tokyo subway attack, Shoko Asahara telephoned Wakatake in Bonn and dictated to him the text of a press communique to be given to the news agency, Agence France Presse (AFP) in Paris.

The communique denied any involvement in the subway incident and accused the Japanese authorities of wanting to eradicate the Aum. Wakatake sent this communique to Silbermann-Hashimoto, asking her to translate it into French and to send it to the AFP. The communique was received by the AFP via fax machine from Munich on March 21, 1995. In addition, subpoenaed phone logs from Aum's New York office show regular contact between Aum offices in New York and Bonn. German law enforcement authorities have no records of any illegal activities by either Wakatake for Silbermann-Hashimoto.

2. *Taiwan*

While the Aum's presence in Germany seemed to have been primarily for recruitment purposes, it's presence in Taiwan was more business-oriented. In June 1993, the Aum established a company in Taiwan by the name of Dai Hanei (Great Prosperity) as a purchasing agent, ostensibly for the purchase of computer parts. Japanese press, citing police sources, have reported that from April 1993 to March 1995 the Aum sent more than 2.5 billion yen ($25 million), through its Tokyo-based Maha Posya company, to Dai Hanei's bank account at the Taipei branch of a Tokyo foreign exchange bank.

Under Japan's Foreign Exchange Control Law, transfers of sums in excess of 5 million yen ($50,000) to an offshore account must be reported to the authorities. According to the police sources, when Maha Posya sent more than 5 million yen at a time it reported the money as being used to buy computer parts. The sources confirmed, however, that Maha Posya had bills for computer parts imports totaling only 100 million yen ($1 million). The remaining 2.4 billion yen ($24 million) is apparently unaccounted for.

The police sources reportedly quoted bank officials in Tokyo as saying that a high-ranking Aum member, who was an executive of Maha Posya and the cult's former Finance Minister, was the individual who made the remittances to Dai Hanei. The sources are also reported to have confirmed that Aum leader Shoko Asahara and the Maha Posya executive visited Taiwan frequently in 1993.

3. *Sri Lanka*

Relatively little is known about the Aum's activities in Sri Lanka. It reportedly owns considerable assets in Sri Lanka, including a tea plantation that the Aum began operating in 1992. The Staff has confirmed that the plantation is managed by an individual named Seizo Imoto and that it uses local citizens as employees. The Aum apparently has had several problems operating the plantation, though, including an inability to pay its employees.

Following the attack on the Tokyo subway, a local organization of Buddhist monks petitioned the Sri Lankan President to confiscate the property of the cult and ban it from the country. Sri Lankan police did investigate the plantation, but nothing was found to indicate any connection between the plantation's operations and the sarin attack.

4. *The Former Yugoslavia*

At some point, the Aum became very interested in the ideas and inventions of Nikola Tesla, a scientist who experimented in the fields of atmospherics, electromagnetics, fluid dynamics, and geodynamics in the early 1900's. According to an official of the International Tesla Society in the United States, a representative of the Aum in New York City, Yumiko Hiraoka, inquired into the Aum becoming a member of the Society. In January 1995, Hiraoka, the manager of the New York office, sought to obtain from the Society a number of books on the inventions of Tesla, his patents, and writings.

When the Staff inquired as to why the Aum would be interested in Tesla's work, the official speculated that they may have sought information on Tesla's experiments with resonating frequencies. He stated that Tesla had experimented in creating earthquakes and that Tesla was quoted as saying that with his technology he could "split the world" in two. He also noted that Tesla had developed a "ray" gun in the 1930's which was actually a particle beam accelerator. According to the official, this gun was reported to be able to shoot down an airplane at 200 miles.

The official also told the Staff that upon Tesla's death the U.S. government had seized most of his papers and research notes. When members of the Society have requested information on Tesla's work under the Freedom of Information Act, much of the material has been "black penned" for national security reasons.

It was for this reason that the Aum sent some of its members to the former Yugoslavia. The Staff has confirmed that from February to April of this year, six members of the cult traveled to the Tesla Museum in Belgrade. There they studied Tesla's writings on something known as the Tesla Coil, a coil used for alternating current. The members also studied Tesla's work on high energy voltage transmission and on wave amplification, which Tesla asserted could be used to create seismological disturbances.

VII. CONCLUSIONS

The threat posed by the Aum today is unknown. It still has substantial assets, thousands of devotees and authorities are unsure whether its weapons and weapons potential has been neutralized. Furthermore, the anti-Western rhetoric and Armageddon prophecies that fueled the tragic and near-cataclysmic incidents in Tokyo and elsewhere, are still evident.

The cult's rise and its efforts to obtain and deploy weapons of mass destruction raises numerous policy issues, however, that extend well beyond the specific threat posed by Asahara and his disciples. The Aum was merely one example—a case study—of what may be the most dominant, emerging threat to our national security.

The ease with which the cult accessed the vast international supermarket of weapons and weapons technology is extremely troubling. It is especially troubling in light of the current state of the economies and governments of the former Soviet Union. How much this cult acquired and how much more they could have obtained is still a mystery. How much the next group may be able to acquire is the question that also remains unanswered.

Furthermore, despite the Aum's relatively overt and far flung activities, not a single U.S. enforcement or intelligence agency perceived them as dangerous, much less a threat to national security, prior to the March 20, 1995 Tokyo subway attack. More than a few representatives of these agencies indicated, as one candid counterterrorism officer admitted, "they simply were not on anybody's radar screen." How does a fanatic, intent on creating Armageddon, with relatively unlimited funds and a worldwide network of operatives, escape notice of western intelligence and law enforcement agencies outside of Japan?

Our witnesses today and tomorrow, as well as at subsequent hearings, will put in context our national security needs and our government's capabilities. A number of questions and observations, based upon our inquiry today, may provide areas for further discussion and improvement:

- *Intelligence:* U.S. intelligence agencies are apparently focusing heavily on official state proliferation of weapons of mass destruction (WMD). Do they need to allocate increased resources to WMD terrorism? Do we need to enhance U.S. intelligence agencies" expertise in biology, chemistry, and nuclear physics? Do we also need to increase their development and acquisition of new technologies to help the U.S. government detect and combat WMD?
- *Need to coordinate U.S. government agencies:* In the future any CBW terrorist action is likely to involve foreign groups or activities. This means that intelligence organizations are likely to have information on such organizations and activities. In addition, law enforcement agencies with international presence like the U.S. Customs Service and FBI may also have information concerning these groups. Law enforcement and intelligence sources must have regular contact and interchange of ideas. Because the goal should be to prevent an attack before it even gets to the formative stages, law enforcement and intelligence agencies may not know what information the other needs or has. A critical need apparently exists for U.S. law enforcement and intelligence agencies to share information and coordinate activities in regard to WMD terrorism. Is there a need for creating a national clearinghouse or all sources intelligence/law enforcement center to give U.S. government analysts access to all relevant terrorist information from whatever source derived to analyze terrorist threats and assist prosecutions? Given the overlapping missions within our government, is there a need for a single, high-level Administration-wide coordinator?
- *Response Capabilities:* During video footage of the Tokyo sarin gas attack, local police could be seen entering the subway without protective clothing next to military or other government officials encased in the most modern protective CBW uniforms. Apparently many of the would-be rescuers became some of the first casualties. Obviously, medical, rescue, fire and law enforcement personnel from the federal to the local level must be trained and equipped to handle a CBW incident. Likewise, hospitals and clinics must be prepared with proper supplies and antidotes to respond to a CBW event. Are procedures in place and adequate resources available for all U.S. government and private agencies to handle such events? In particular, are current funding levels for our Federal Emergency Management Agency adequate to successfully coordinate a national response to this threat?
- *Strengthen export controls:* The trend recently in the U.S. has been toward liberalizing export controls. Should policy makers revisit this policy and consider strengthening controls on some of the dual use items used for making WMD materials?

- *Promote Self-Policing:* In the case study of the Aum, certain U.S. companies who were approached by the Aum and its corporate alter-egos, became suspicious of the Aum's end-use of their products. Ultimately, certain transactions were not consumated. Conversely, other companies did not ask the right questions or simply did not care. The U.S. business community has a duty to its consumers and our Nation to recognize dangers of many of its dual-use items and act responsibly. Although, to a great extent, the case study of the Aum appears to demonstrate some success with our joint government/industry educational program, can and should more be done in this area to improve corporate awareness?
- *Ratification of CWC:* Since the Subcommittee's last hearing on this issue in 1989, the CWC has been under consideration. Would ratification of this treaty give the U.S. government increased leverage in halting the spread of chemical weapons? Would this be especially true if ratification were accompanied by passage of a domestic law that instituted a national, computerized clearing house for dual-use chemicals and apparatus used to make chemicals, similar to export control mechanisms that track end-users and give the end-users" purpose for purchasing the item?
- *Open source information on WMD:* Recipes and directions for making weapons of mass destruction (WMD) are readily available in the open literature and now on the Internet. The U.S. government is considering declassifying additional information about the U.S. biological weapons program. Does such open source literature on WMD makes it easier for would-be terrorists and other governments to make these weapons? Is there a need to study how to control access to such information while still safeguarding our First Amendment guarantees?
- *Global cooperation:* Few terrorists are now just domestic terrorists. Almost all are now international terrorists to some degree. Most travel and buy goods throughout the world. Are additional international agreements needed among at least the P–8 countries (G–7 plus Russia) to address this international aspect of terrorism? Is there a need for an agreement that would encourage that member countries share information involving WMD terrorism that may have international implications?

APPENDIX A

AUM SHINRIKYO MEMBERS [1]

Name	Title
AOYAMA, YOSHINOBU	Aum Shinrikyo lawyer
ASAHARA, SHOKO	Aum Shinrikyo leader
Asano, Shinya	Aum member, former Japanese Self Defense Force member
Chow, Tom	Head of the Aum affiliate in Taiwan
ENDO, SEIICHI	Head of the Aum Health and Welfare Ministry and top biologist
Fujinaga, Kozo	Aum Science and Technology subordinate
Furukawa, Masao	Subordinate to Hayakawa—organized shooting tour to a Russian military base
Hara, Yoshihiro	Aum member connected by the Japanese police to preparations for the Tokyo attack
Hasegawa, Shigeyuki	Runs two Aum affiliated chemical companies
Hashimoto, Saturo	Aum Home Affairs Ministry subordinate—sprayed Sarin related to the Tokyo attack
Hatakeyama, Hironobu	Aum member connected by the Japanese police to preparations for the Tokyo attack
HAYAKAWA, KIYOHIDE	Construction Ministry Head
HAYASHI, IKUO	Head of Aum's medical division, the Treatment Ministry
Hayashi, Yasuo	Aum member in the Science and Technology Ministry—connected by the Japanese police to the Tokyo attack
Hiramatsu, Yasuo	Upper management member of Aum who acted as purchasing agent for United States purchases
Hiraoka, Yumiko	Aum Nun and sect leader of Aum's New York office
Hirata, Masayuhi	Aum doctor
Hirose, Kenichii	Indicted for participating in the Tokyo gas attack
Horii, Takahisa	Aum doctor
Ikeda, Itsuro	Aum member connected by the Japanese police to preparations for the Tokyo attack
INOUE, YOSHIHIRO	Head of Aum's Intelligence Agency and Action Squads
Jo, Hiroyuhi	The man who stabbed Murai

AUM SHINRIKYO MEMBERS [1]—Continued

Name	Title
JOYU, FUMIHIRO	Former Aum leader in Moscow—since March 1995, he has been the lead spokesman for Aum in Japan
Kadokawa, Tomoki	Science and Techology Ministry subordinate
Katahira, Kenichiro	Aum doctor
KIBE, TETSUYA	Aum's Defense Agency Chief
Kikuchi, Naoko	Aum Health and Welfare Ministry member related by the Japanese police to the Tokyo attack
Kitamura, Koichi	Aum Home Affairs subordinate related by the Japanese police to the Tokyo attack
Kobayashi, Katsuhiko	Science and Techology Ministry subordinate, chemical team member, and secretary to a senior Aum member
Maruyama, Michimaro	Aum member connected to the Tokyo attack
MATSUMOTO, CHIZUO	Lay alias for Asahara
Matsumoto, Takeshi	Aum member suspected in the abduction of a Japanese notary official
MATSUMOTO, TOMOKO	Asahara's wife
Mitsuka, Yoshihiro	Aum member connected by the Japanese police to preparations for the Tokyo attack
Moriwaki, Yoshiko	Aum member connected by the Japanese police to preparations for the Tokyo attack
MURAI, HIDEO	Head of the Aum's Science and Technology Ministry
NAKADA, KIYOHIDE	An Aum senior sect member in the Home Affairs Ministry and Construction Ministry
NAKAGAWA, TOMOMASA	The Aum's Household Agency Director
Nakamoto, Hideo	Mitsubishi employee arrested for suspicion of helping an Aum and former Self Defense Force member steal company secrets
Nakamura, Noburu	Aum Home Affairs Ministry subordinate—sprayed Sarin related to the Tokyo attack
Nakano, Katsuhiko	Aum member arrested in connection with gun manufacturing
NIIMI, TOMOMITSU	Head of the Aum Home Affairs Ministry
Ochida, Kotaro	An Aum pharmacist—strangled by Yasuda
Oikawa, Takayuki	Aum member—arrested in connection with gun manufacturing
Oka, Hideki	Aum member connecetd by the Japanese police to preparations for the Tokyo attack
Okada, Hiroyuki	Aum member connected by the Japanese police to preparations for the Tokyo attack
Ouchi, Toshiyasu	Defacto head of the Aum sect in Moscow since March 1995
Sasaki, Kayoko	Aum member connected by the Japanese police to preparations for the Tokyo attack
Satoru, Hirata	Aum Intelligence Agency member connected to the kidnapping of a Japanese notary official
Shirai,Takahisa	Aum member and former Japanese Self Defense Force member
Sotozaki, Kiyotaka	Aum member connected by the Japanese police to the Tokyo attack
Sugimoto, Shigeo	Aum Home Affairs Ministry member indicted for the Tokyo gas attack—alleged to have strangled another Aum member
Takahashi, Katsuya	Aum Intelligence Agency subordinate
Takizawa, Kazuyoshi	Aum scientist
Tashita, Seiji	Aum member connected by the Japanese police to the Tokyo attack
Terajima, Keiji	Aum Home Affairs Ministry subordinate—helped make Sarin
Togashi, Wakashio	Aum Science and Technology subordinate
Tomita, Takashi	Aum Home Affairs Ministry subordinate
Tonosaki, Kiyotaka	Aum member indicted for Tokyo gas attack
Toyoda, Toru	Aum member indicted for Tokyo gas attack
TSUCHIYA, MASAMI	Head of the Aum's Chemical Division of the Science and Technology Ministry and the top chemist
Uchiyama, Rie	Aum member—kidnapped her father
Watabe, Kazumi	Aum Science and Technology Ministry subordinate and engineer
Yamagata, Akira	Aum Home Affairs Ministry subordinate and former Japanese Self Defense Force member—alleged to have used VX gas to kill renegade Aum members
Yasuda, Hideaki	Aum member who strangled Ochida
Yokoyama, Masato	Aum member indicted for Tokyo gas attack

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[1] This document was compiled and prepared by Permanent Subcommittee on Investigations' Staff using police records, news articles, and other open sources. ALL UPPER CASE INDICATES KEY AUM MEMBERS.

APPENDIX B

The Cost of Devotion

The following is a list of the cost of "religious" training that Aum Shinrikyo followers and visitors are told to undergo and items they were ordered to purchase.

Training Courses

A devotee has to pay ¥5,000 if he or she wants to change course midway through the training

Initiation fees:	¥30,000 (for non-followers)
Monthly membership fees:	¥3,000

Yoga course for spiritual emancipation

(Eachclass lasts for three hours)

Beginner course (10 classes):	¥30,000
Intermediate course (20 classes):	¥35,000
Advanced course (20 classes):	¥80,000
Correspondence course	
1st section (60 days):	¥70,000
2nd section (60 days):	¥70,000
Late night seminar (six hours for each class):	¥6,000
Intensive overnight seminar:	¥7,000–¥8,000

Advanced course for the acquisition of supernatural power

Comprehensive program for supernatural powers (for two sessions a month):	¥15,000
Initiation (one session):	¥15,000
Correspondence course:	¥15,000
Supernatural power seminar:	¥20,000

Shaktipat

A ritual which allegedly enables a member to gain spiritual energy through touching the forehand of another member with a higher spiritual level. To receive Shaktipat training from cult guru Shoko Asahara, a devotee must have earlier gone through 60 units of training and made a donation of more than ¥50,000.

To receive training from one of Ashara's disciples who have achievved emancipation, a trainee has to have undergone 30 units of training and made a donation of more than ¥30,000.

Intensive training in "Madness"

An 11 -day course:	Donations of more than ¥220,000

Blood Initiation

Ritual drinking of blood that suppsedly came from Asahara:	¥1 million

Secret Initiation

	Donations of more than ¥1 million

Special Initiation

	¥300,000 or ¥500,000 course

Bardo's Enlightenment

Intravenous injections of unknown content:	¥300,000

ITEMS

· "PSI" telepathy headgear (a helmet with electric wiring that supposedly synchronizes a folLower's brain waves with those of Ashara):	¥1 million to rent per month
· Videotapes on yoga and training:	¥80,000 - ¥400,000
· Purusha (a small button with the sect's logo engraved upon it):	¥100,000
· Miracle Pond (a 200cc bottle containing water from Asahara's bath:	¥20,000
· Sandalwood rosary (set of two):	¥15,000
· Video tape of Aum seminars:	¥15,000
· Purusha-shaped treasure box:	¥10,000

Note: The menu and the prices are as of 1989, and were detailed in a cult pamphlet quoted by the Sunday Mainichi news magazine and other sources.

Reprinted from the Japan Times: Special Report - TERROR in the heart of Japan, The Aum Shinrikyo doomsday cult, July 1995

APPENDIX C

AUM SHINRIKYO FACILITIES

Okamura Tekko Ishikawa Prefectre—cult took over Hydraulic cylinder factory, 60–70 cult members work there
Tomizawa Yamanashi Prefecture—Aum Facility to produce firearms
Matsumoto—Aum two story facility
Tokyo Minami Aoyama—Aum HQ in Tokyo
Tokyo—Aum Co. HQ 287 Setagaya Setakayu-ku
NYC—Am Supreme Truth 8 East 48th St, NYC
Shizuoka Prefect—Aum facility
Yamanashi Prefect—Aum facility
Kamikuishiki Yamanshi Prefecture—Aum Training Center at the foot of Mt. Fuji
Bonn—Aum sect activities
Tokyo Nakano Ward—Aum affiliated hospital
New York City Columbia College—Small Aum chapter
Okinawa Prefecture—Aum facility
Namino, Kumanoto Prefecture—Aum HQ before Kamikuishiki, evacuated
Tomizawa,Yamanashi Prefecture—Aum facility. Police seized steel pipes resembling gun barrels.
Vladivostok, Russia—Aum attempt to lease Mil–26 transport helicopter
Ukraine—Alleged to have approached arms dealer to purchase two T–72s main battle tanks
Fujinomiya, Shizuoka Prefecture—Aum commune
Zaire—Aum studied alleged ebola outbreak
Naganohara, Gunma Prefecture—Aum facility
Osaka, Cuo Ward—Aum facility
Fujinomiya, Shizouka Prefecture—Aum facility
Omiya, Saitama Prefecture—Aum Apartment

AUM SHINRIKYO COMPANIES

UNITED STATES

A.U.M. Publishers, 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687
A.U.M. Company Ltd., 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687
Asahara, AUM USA Co., Ltd., 53 Crosby Street, NY, NY
AUM Publishing, 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687
Aum Inc, 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687
Aum Supreme Truth, 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687
Aum, 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687
Yoga Center, 8 East 48th Street, #2E, NY, NY 10017 (212) 421–3687

JAPAN

Aum Hospital, Nakano Ward, Tokyo
Aum's Computer Support Center, Sapporo City, Egi Building, 3-chome, Minami Nijo, Chuo-Ku, Sapporo City
Aum's Computer Support Center, Osaka Nihonbashi Shop, Sanki Medical building, 5–9–2 Nihonbashi, Naniwa-ku, Osaka
Aum's Computer Support Center, Nagoya Shop, 3–31–12 Osu, Naka Ward, Nagoya City
Aum's Computer Support Center, Akihabara Shop,
Kokiso Building, 4–4–3 Sotokanda, Chiyoda-ku, Tokyo
Aum's Computer Support Center, Minami Aoyama Center, Mahaspohsa Building, 7–5–22, Minami Aoyama, Minato-ku, Tokyo
Bell Epoch
Beck
Cafeteria Unmei No Toki, Nishi Eifuku, 5–54–5 Eifuku, Suginami-ku, Tokyo
Hasegawa Chemical Company
Hikari Seimitsu Kogo, Fuji, Shizuoka Prefecture
Imagawa Juban Yaki, Kameido, 5–29–21 Kameido, Koto-ku, Tokyo
Mahapsya Inc of Japan, 7–5–12 Minami Ayoama, Minato-ku, Tokyo
Oumo Shinrikyo
Seiki Toitsu Tsusho Sangyo, aka: World Unified Trade and Industry World Unification Industry
Shimomura Chemical Company
Shinrito, 3–8–11 Miyamae, Suginami-ku, Tokyo

Umakarou Yausukarou Tei, Ekoda, 1–52–1 Kotake-cho, Merima-ku, Tokyo
Umakarou Yasukarou Tei, Kichijoji, 4–25–7 Honcho, Kichijoji, Musashino City, Tokyo
Umakarou Yasukarou Tei, Kinshicho, Waise Building, 1–11–4 Taihei, Sumida-ku, Tokyo
Umakarou Yasukarou Tei, Maruta-cho, Kyoto, 10–5 Jurakumawari Higashi-cho, Nakagyo-ku, Kyoto City

AUSTRALIA

Clarity Investments PTY, Ltd., c/o Murchia and Associates, Barristers and Solicitors, 250 St. Georges Terrace, Perth, Australia
Mahaposya Australia PTY, c/o Murchia and Associates, Barristers and Soliciters, 250 St. Georges Terrace, Perth, Australia

TAIWAN

Dai Hanei (Great Prosperity)
Maha Posya, Inc, Taipei

APPENDIX D

CHRONOLOGY OF MAJOR EVENTS: THE AUM SHINRIKYO "DOOMSDAY CULT"

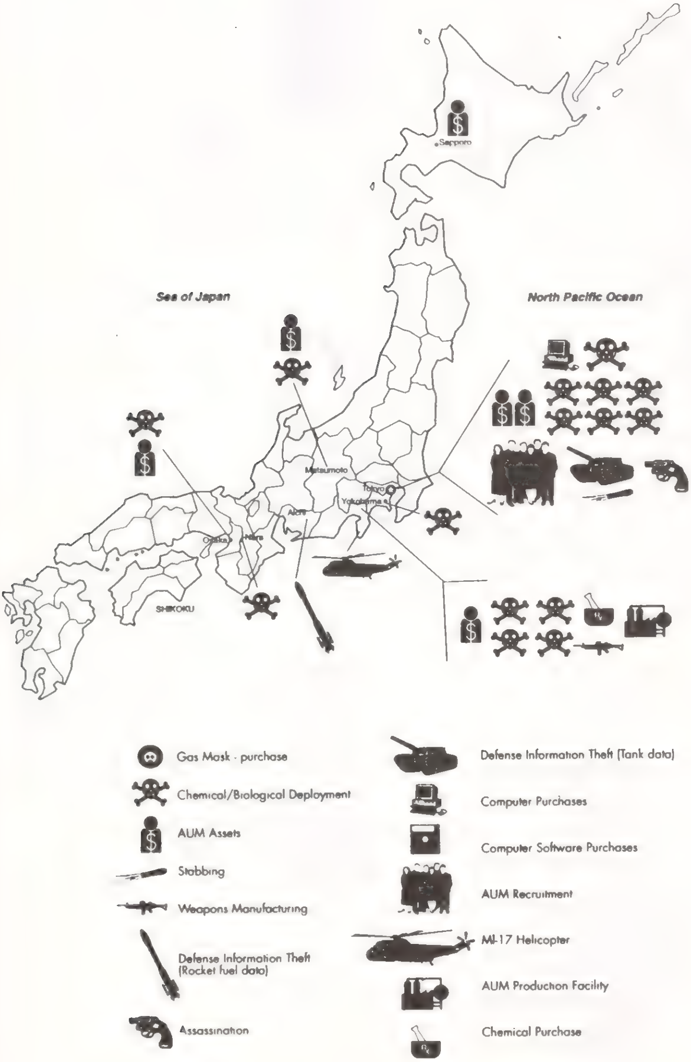
Name	Title
1984	Asahara forms the Aum Shinsen-no kai Company, a book publisher and yoga training center.
1987	The name of the organization is changed to Aum Shinrikyo.
1987	Aum USA Company Limited is incorporated in New York City.
August 1989	Aum Shinrikyo is recognized as a religious corporation by the Tokyo Metropolitan Government.
February 1990	25 Aum members, including Asahara, run for the Lower House but none are elected.
1991	Aum Shinrikyo begins religious activities in Moscow.
October 1992	Aum "medical mission" sent to Zaire to obtain a sample of the deadly Ebola virus.
June 1992	The Russian Ministry of Justice registers Aum Shinrikyo as an official religious organization.
June 1993	The sect purchased a 500,000 acre sheep ranch in Western Australia.
June 1993	Noxious fumes from a building believed to be affiliated with the sect cause 100 people to complain in the Koto Ward of Tokyo.
September, 1993	Asahara and up to 26 other sect members visit the ranch in Australia.
April 1994	Aum members visit Australia to investigate the possibility of extracting uranium.
June 1994	The sect purchased an MI–17 helicopter from Russia.
June 27, 1994	7 die and over 500 are injured when the sect releases sarin gas in Matsumoto.
July 1994	The sheep ranch in Australia is sold at a loss.
July 1994	Residents repeatedly complain of peculiar odors from the sects Kamikuishiki complex.
Sept. 1, 1994	231 people in seven towns in western Japan (Nara prefecture) suffer rash and eye irritations from unknown fumes.
Dec. 12, 1994	Aum Home Affairs Ministry head Tomomitsu Niimi attacks a man with VX nerve gas. The man dies ten days later.
January 1995	Niimi attacks Hiroyuki Nagaoka, the leader of the Association of the Victims of Aum Shinrikyo, with VX gas but he survives.
March 5, 1995	11 people hospitalized from strange fumes in the Keihin Kyuko train line in Yokohama.
March 15, 1995	Three attache cases containing liquid, fans, vents, and batteries are discovered in the Kasumigaseki subway station in Tokyo.
March 20, 1995	12 die and 5,500 are injured from sarin gas released in five trains of the Tokyo subway system.
March 30, 1995	The director of the National Police Agency is shot.
April 1995	A Russian court bans all Aum Shinrikyo activities.
April 4, 1995	Odors are noticed from a suspected Aum hideout in Shinjuku Ward, Tokyo.
April 8, 1995	Ikuo Hayashi, the head of the Treatment Ministry is arrested.

CHRONOLOGY OF MAJOR EVENTS: THE AUM SHINRIKYO "DOOMSDAY CULT"—Continued

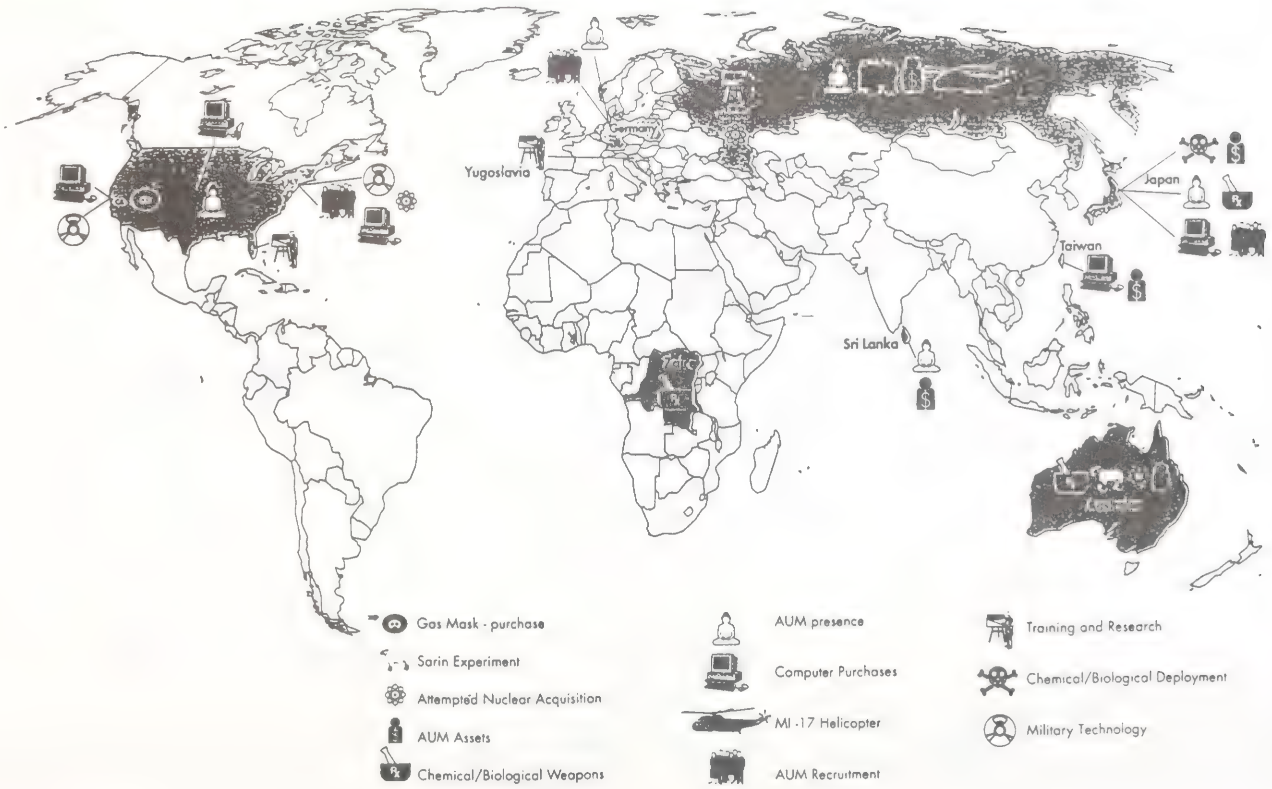
Name	Title
April 11, 1995	20 people complain of sore throats and a foul odor on the Keihin Kyuko line in Yokohama.
April 12, 1995	Tomomitsu Niimi, head of the Home Affairs Ministry is arrested.
April 19, 1995	500 people are hospitalized due to mysterious fumes in the Yokohama railway system.
April 19, 1995	Kiyohide Hayakawa, the Aum Construction Minister, is arrested.
April 21, 1995	27 people are overcome by fumes in a store near the Yokohama rail station.
April 23, 1995	Hideo Murai, the Aum Shinrikyo Science and Technology Minister, is stabbed to death in front of Aum headquarters.
April 26, 1995	Seiichi Endo, the head of the Health and Welfare Ministry and Masami Tsuchiya, the head of the Chemical Division of the Science and Technology Ministry, are arrested.
May 3, 1995	Yoshinobu Aoyama, the sect's lawyer is arrested.
May 5, 1995	Two bags of poison gas are found in the men's restroom in the Shinjuku subway station in Tokyo.
May 3, 1995	Traces of Sarin are found in samples, taken in March, from 24 dead sheep on the ranch previously used by the sect in Western Australia.
May 15, 1995	Yoshihiro Inoue, the Aum Intelligence Agency head is arrested.
May 16, 1995	Shoko Asahara, Aum leader, is arrested.
May 16, 1995	A parcel bomb explodes in the offices of Tokyo's Governor, wounding an aide.
June 26, 1995	Asahara's wife, Tomoko Matsumoto, is arrested.
July 4, 1995	Poison gas is found in the women's restroom on the Hibiya line, Kayaba-Cho subway station and in the men's restroom of the Japanese Railway Shinjuku station in Tokyo.
October 6, 1995	Tokyo District Court holds hearings on the disbandment of Aum Shinrikyo.
October 7, 1995	Fumihiro Joyu, the sect's spokesman is arrested.
October 26, 1995	Asahara's trial continued to a date uncertain.

AUM SHINRIKYO JAPAN ACTIVITIES

APPENDIX E

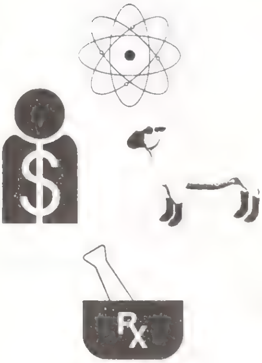


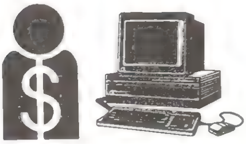
AUM SHINRIKYO GLOBAL ACTIVITIES

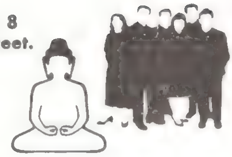
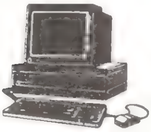
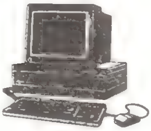


APPENDIX F

WORLD MAP

COUNTRY	ICON	SIGNIFICANCE
Australia		AUM purchased property in Australia in 1993 to utilize in the extraction of uranium. AUM carried out experiments with Sarin on sheep in Australia. Traces of chemicals used to make Sarin found in soil and wool of dead sheep.
Germany		AUM tried to recruit people in Germany.
Russia		AUM purchased broadcast time on Russian radio and television stations and owned radio transmitter tower in Vladivastok.
Russia		Recruitment activities.

Russia, Moscow		Two AUM members sent toairfield near Moscow to train as helicopter pilots.
Russia		MI -17 helicopter dismantled and imported in June 1994
Russia, Moscow		AUM began religious activities in Moscow in 1991.
Sri Lanka		AUM owned and operated a tea plantation.
Taiwan		AUM established purchasing agent in Taiwan and utilized it for purchases of computers and parts.
USA, Bridgeport		$400,000 machine manufactured to grind mirrors and lenses bought by AUM in 1994.

USA, NYC, NY, 8 8 East 48th Street.		AUM USA Company Ltd. Incorporated as a nonprofit through which they buy US computers and other equipment.
New York		AUM purchased computers and software from various US sources.
USA Long Island		AUM downloaded Internet info on making toxin from the venom of the green mamba snake.
USA, Fremont CA,		Computer chips purchased manufacturing equipment purchased through a Fremont computer company.
USA, St Louis, MO, San Deigo, CA		AUM bought and returned software which could have helped design new toxins.
USA, Las Vegas, Nevada		AUM member attended a sporting goods trade show and ordered gas masks and camping gear in January 1995.
USA, Union City, CA		Gas Masks prepared to be shipped to cult members in Japan through Fremont, CA.

USA, Florida

AUM members received private helicopter training.

Zaire, Africa

AUM funds medical mission to Zaire in 1992 to assist in treatment of Ebola Virus victims.

JAPAN MAP

LOCATION	ICON	SIGNIFICANCE
Tokyo	☠	Sarin subway attacks 3/20/95.
Tokyo	☠	Ikeda shot with sarin projectile by Tomoitsu Niimi.
Tokyo	🔫	Miimi shoots NPA Commissioner General Kunimatsu.
Akihabara	$	Computer shop sales.
Tokyo	$	Computer shop sales.
Osaka	$	Computer shop sales.
Sapporo	$	Computer shop sales.

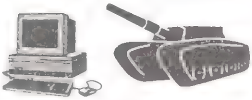
Tokyo	$	Computer shops/coffee shops and restaurants.
Japan	🚁	MI-17 helicopter bought from Russia. Later attempted to hire crew and pilots from airline companies and helicopter operations firms.
Kamikuishiki	$	AUM owns 1,000 square meters of property for their HQ.
Kamikuishiki	$ ☠ 🏭	Satian No. 7 completed.
Tokyo	🔪	AUM's chief of science and technology stabbed.
Osaka	☠	Hamaguchi died after being exposed to VX gas.
Kamikuishiki	☠	Gas odors near AUM facilities.
Yokohama	☠	Nineteen people taken to hospital after they inhaled fumes in a train car. Source of fumes not found.
Kamikuishiki	☠	Sarin by-product found.

Tokyo	☠	Sarin subway attacks on March 20, 1995.
Nara State	☠	Over 231 in seven towns in Nara suffer rashes and eye irritation from unknown fumes.
Matsumoto	$ ☠	7 die, 200 plus stricken by Sarin fumes. AUM owns real estate.
Tokyo	☠	Over 100 complain about noxious white fumes rising from AUM building.
Tokyo	☠	AUM hit squad attempt to kill 83 year old man with VX.
Tokyo	☠	Three pieces of luggage containing sprayers were place in the Kasumigaseki subway station.
Tokyo	☠	Bag of sodium cyanide and a bag of sulfuric acid found together in Shunjuku subway men's room.
Kamikuishiki	☠	Reports tell of AUM scattered bones of dead followers outside compound after breaking them up in a large grinder.

Kamikuishiki

Police seize machine gun parts and LSD at AUM complex.

Tokyo



AUM members broke into a defense contractor office and stole data on tanks and laser equipment.

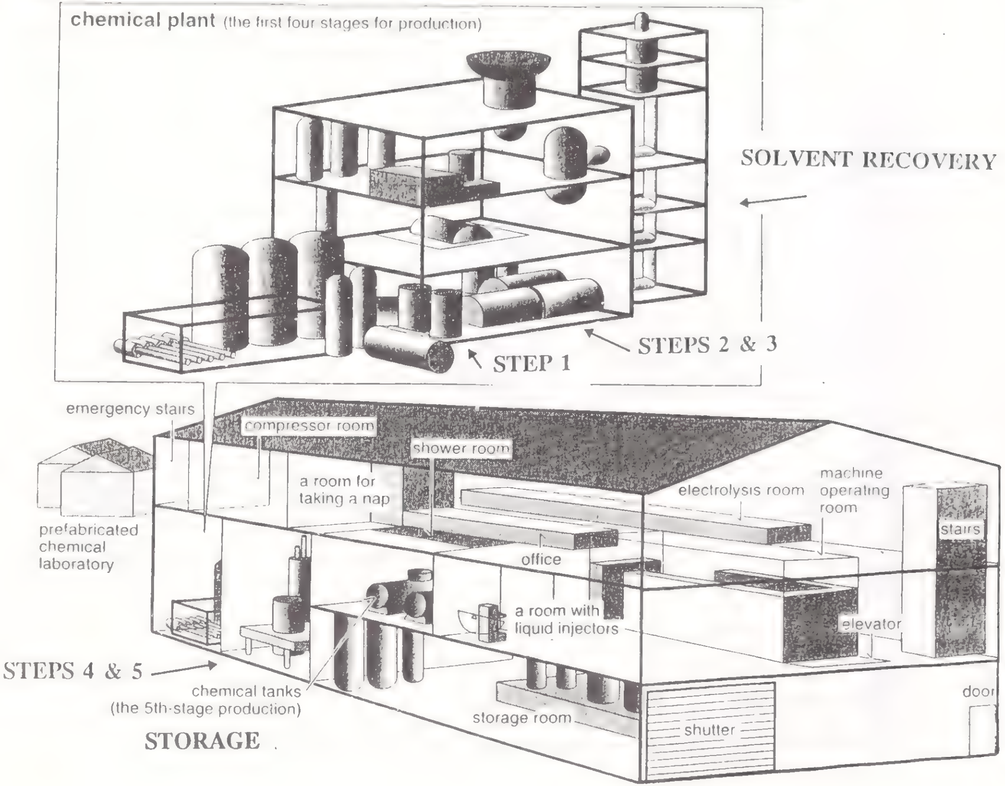
Aichi

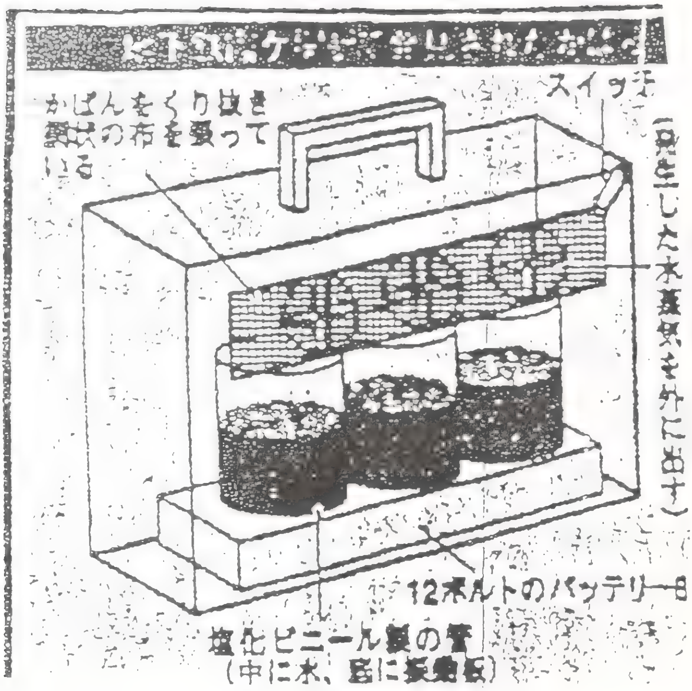
AUM members broke into a chemical plant and stole gunpowder and rocket fuel data.

Tokyo

AUM members lured day workers by telling them they were being employed as movie extras then preached cult information to them

The interior of Satian No. 7, a suspected sarin production plant



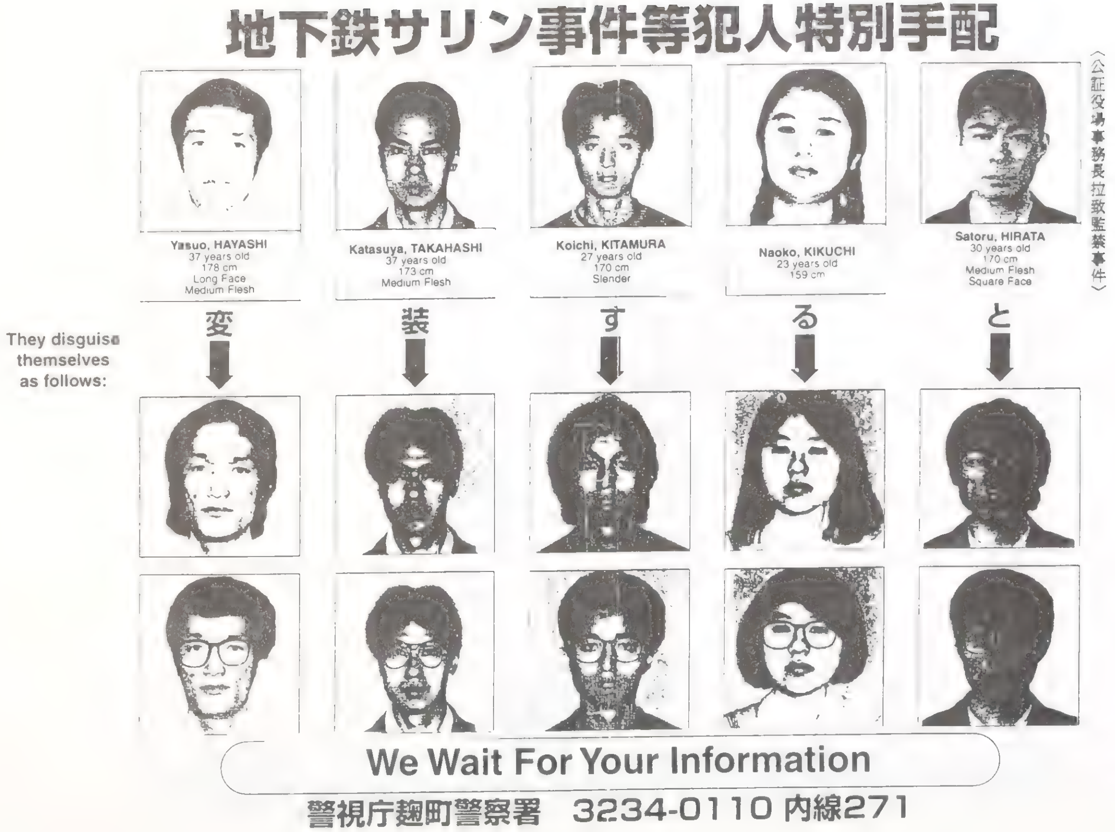


UNCLASSIFIED

Figure 5. Attache case left at Kasumigaseki Station

APPENDIX 1

March 1995 Aum Attack on the Tokyo Subway System



地下鉄サリン事件等犯人特別手配

〈公証役場事務長拉致監禁事件〉

Yasuo, HAYASHI
37 years old
178 cm
Long Face
Medium Flesh

Katasuya, TAKAHASHI
37 years old
173 cm
Medium Flesh

Koichi, KITAMURA
27 years old
170 cm
Slender

Naoko, KIKUCHI
23 years old
159 cm

Satoru, HIRATA
30 years old
170 cm
Medium Flesh
Square Face

They disguise themselves as follows:

変装すると

We Wait For Your Information

警視庁麹町警察署　3234-0110 内線271

Senator NUNN. Our next panel will be Kyle Olson, Senior Staff, Arms Control and Proliferation Analysis Center of TASC, Inc.; Colonel Edward Eitzen, Jr., who is a doctor, the Chief, Preventive Medicine Department, Medical Division, U.S. Army Medical Research Institute for Infectious Diseases; and James A. Genovese, Chief, Chemical/Biological Antiterrorism Team, U.S. Army Chemical/Biological Defense Command.

I would ask all of you who are going to be testifying, before you take your seats, we swear in all the witnesses before the Subcommittee. So if you will just hold up your right hand, do you swear the testimony you will give before this Subcommittee will be the truth, the whole truth, and nothing but the truth, so help you God?

Mr. OLSON. I do.

Colonel EITZEN. I do.

Mr. GENOVESE. I do.

Senator NUNN. Thank you.

I believe Mr. Olson is going to lead off today, and I think all of you have performed great service for us, both in your discussions with staff and being here today. Your entire statements will be part of the record, and to the extent that you can summarize those, it will give us more time for questions, since we have one more panel after this one. It is not a panel; it is one witness. But I will ask Mr. Olson if you will begin, and we thank you for being here.

TESTIMONY OF KYLE B. OLSON, SENIOR STAFF, ARMS CONTROL AND PROLIFERATION ANALYSIS CENTER, TASC, INC.

Mr. OLSON. Thank you, Mr. Chairman. Thank you for the opportunity to speak with the Members of the Subcommittee this morning.

I am a member of the senior staff at TASC, Inc. and its Arms Control and Proliferation Analysis Center in Rosslyn, Virginia. In that capacity, I work on chemical and biological arms control, counterproliferation, and counterterrorism issues for government and private sector clients both here in the United States and abroad.

It is with very little pleasure that I am able to say that the March 20 subway attack did not come as a surprise; in fact, it realized a concern I had known for several months. I first visited Japan in December of last year to investigate the Matsumoto sarin attack. As you know, that first attack received very little attention outside of Japan. In fact, I first became aware of it some 3 months after the attack when I was approached by the Nippon Television Corporation and asked to serve as a consultant on a broadcast commemorating the 6-month anniversary of the great unsolved Matsumoto mystery. As I looked into the case, I found myself rather astonished by the things that I was discovering. It became my firm belief after a very short time that the Matsumoto victims had been the subjects of a terrorist attack. I also believed, based on several factors, that this had been a field test in preparation for a full-blown strike of larger proportions yet to come.

I concluded that an unknown terrorist group had, for the first time in world history, demonstrated the ability and willingness to use a weapon of mass destruction against innocent targets. It was clear to me that whoever had done it would strike again and that the next target would have to be much higher profile. In a report which I circulated both within Japan and here in the United States in January of this year, I specifically pointed out the vulnerability of the Tokyo subway during rush hour to such a nerve gas assault.

I have revisited Japan about a half dozen times since that tragic Monday in March. I have had the opportunity to speak with members of the Aum Shinrikyo, with victims of the attacks in both Matsumoto and Tokyo, and with residents of Kamakuishiki, the cult compound/complex at the foot of Mt. Fujiyama. I have examined mountain caches of highly toxic chemicals and seen police divers recovering pieces of assault weapons tossed into reservoirs by the cult north of Tokyo. I have even had the dubious pleasure of receiving phone calls and faxes at my office and at home from Tokyo-based members of the Aum Shinrikyo inviting me to visit the country on their behalf.

In short, I have been well and rather truly engaged in this case longer than most people in this room even knew there was a case. Many if not all of my factual findings have already been shared with the staff and are incorporated, I think, within the excellent staff report which has been already entered into the record. As a result, I am not going to consume your time restating those facts, astounding, fascinating, and frightening as they are. Instead, I would like to address some of the lessons that I think we can take away from the story of the Doomsday Cult.

If this were simply an isolated band of religious extremists on the other side of the world, that would be one thing. We might be able to discount it as just a Halloween story with which to frighten children. It probably wouldn't be something that this Subcommittee would have to worry about. But this is a lot more than that.

The cult's acquisition and use of chemical weapons, as well as their plans and efforts to acquire other weapons of mass destruction, touches on a host of issues of critical importance to this country and to the international community as we strive to make sense of an unexpectedly changing world. Again, this Subcommittee should be applauded for casting its light on these questions.

The story of the cult's multinational reach and its apparent success in pursuing an agenda of this kind without any outside interference or without any outside apparent detection demand scrutiny even without the broader context. But as a case study in the potential of modern terror, the Aum Shinrikyo's is a story we have to pay a lot of attention to.

One of the lessons I think we can draw from this—and it has been stated earlier by the Members of this Committee—is that the threat of terrorist use of weapons of mass destruction has never been greater; and at the same time, it is never going to be less than it is right now.

The world has become a more dangerous place. The U.S. State Department has concluded (based on its study of terrorist activity over the last decade or so) that in the last 5 years the number of terrorist events has declined. Conversely, the lethality of each of those individual events has, on average, increased. The technology of terror has escalated over the last half decade, and the escalation shows no sign of ending.

The decision by the Aum Shinrikyo to pursue weapons of mass destruction and their relative success in this pursuit is the logical extension of that trend. I would argue that, given the trend toward escalating violence by sub-national groups and by numerous studies of terrorist psychology, this is not a nightmare likely to disappear when we turn on the lights. To the contrary, the line in the sand has been irrevocably erased.

From a security planning perspective, I believe we have to assume that we have entered a world in which chemical, biological, and perhaps even nuclear cards are in the terrorists' hands. I do not believe it coincidental that in the weeks after the Tokyo attack, terrorists or extremists in both the Philippines and Chile threatened the use of chemical weapons against civilian targets.

The second point we take away and which has been touched on in the previous panel is that no one has an effective defense against terrorism involving weapons of mass destruction, particularly chemical and biological weapons. It is a sobering truth. We don't have the capability at present to effectively defend our cities against a clandestine attack involving these weapons.

In the case of BW, it is unlikely we would even known we had been attacked until people started to fall down. We don't have adequate vaccines on hand, nor do we have adequate planning in place at the local, State, or Federal levels to manage the effects of even a relatively small, unsophisticated BW attack of the kind planned by the Aum Shinrikyo. We would probably fare a little bit better against CW, but that is primarily a function of the nature of the weapon, not a credit to our preparedness.

The Department of Defense has recognized the biological weapons threat and has devoted some considerable efforts to the problem of detecting and countering BW and also chemical weapons out in the field, protecting our forces. These efforts need to be accelerated by this administration and by this Congress as a means of assuring that at least our first line of defense is able to operate in the face of this threat. Effective military defenses, including a viable vaccine production and stockpiling program, which is currently on hold awaiting further study within the interagency process, could serve as the foundation for a meaningful civil defense program at some point down the road.

In the absence of a commitment to protecting our civilian population, the only organized response we can realistically hope to offer the victims of a terrorist biological weapons attack is a form of triage: Bury the dead, comfort the dying, and pray for the survivors.

Another of the lessons from Tokyo is that CW and BW are not high technology anymore. The cult attacks were not technically sophisticated as executed in Matsumoto or in Tokyo. You may recall that at the time of the Tokyo attack a number of military specialists stated their opinion that they didn't believe sarin had been used in the subways. The number of fatalities was much too low, and certain other aspects, such as some of the smells that we now know can be attributed to impurities in the sarin mix and to the solvent used to accelerated its evaporation were inconsistent with nerve gas. The experts were confused because the cult indeed got a lot of it wrong when they were cobbling their subway attack together. But keep in mind they put this plan together over a weekend. The decision to attack was made on Friday when the cult became aware that they were going to be subjected to police raids. The attack followed on Monday. If they had had more time, they could have probably put together a somewhat more impressive technical show.

The lesson here is that these weapons are dangerous even when you get them wrong. Much has been made of the cult's scientific capabilities. I think it would be a mistake to focus so much on this aspect of it that we discount the danger from groups that don't recruit from Tokyo University. The technology of chemical weapons is 50 to 60 years old. The cult's activities with CW and BW present a roadmap for would-be users of this technology. CW, at the least, is within the reach of any group prepared to pick up the newspapers and read about how it was done in Japan. That certainly includes a number of organizations hostile to the interests of the United States.

One of the bits of good news, if there is some, is that the cult never really seemed to master the dark art of biological weapons. At least if they did, they didn't demonstrate it in the field. That they produced deadly toxins is beyond question. They certainly had a laboratory dedicated to this purpose as early as 1990. They reportedly laced the foods of some of the members of the cult who fell out of favor with toxins and served them this delicacy as a way of maintaining discipline within the ranks.

Asahara himself and a group of his followers apparently traveled to Zaire a couple of years ago in a quest to acquire the Ebola virus as a possible biological weapon. And just to clarify a point that was raised, Senator Nunn, by your question in the last panel, indications seem to be that biological toxins have been released in Tokyo at least once, and possibly twice. The Japanese police have confirmed at least one incident in which toxins were released into the environment.

Fortunately, other than the cult members who found themselves ingesting toxins over dinner, it appears that no one else was injured by biological weapons from the cult laboratories.

While it is somewhat reassuring to conclude that while the culturing of organisms is easy, weaponizing them is difficult, it would be a mistake to assume that is a shield we can hide behind for very long. I myself have been to at least two conferences this year at which experts have sat around in very large rooms discussing the technical errors made by the cult and openly discussing the necessary steps to make the weapons much more dangerous.

It seems clear that the Aum Shinrikyo's biological weapons research has established a foundation upon which other groups can very likely and will build.

The fourth lesson has been referred to before. I am going to put a slightly more bald face on it, but I want to be careful about how I put it.

In the case of the Aum Shinrikyo, I believe it is fair to say that our intelligence community let us down. To say that the Aum was not on their radar screens prior to the Tokyo attack says some rather unflattering things. The Matsumoto attack in June of last year was the biggest news story in the second most powerful nation in the world for weeks. It constituted the first non-military use of nerve gas. It shattered precedents. The additional fact that tens of thousands of Americans live and work in Japan would, you might think, have brought this to the attention of someone.

Yet after a very brief flurry of interest within our intelligence ranks because of the sarin element of the story, this was apparently classified as a domestic Japanese issue. Instead of committing more resources to learning about it, instead of pressuring the Japanese to tell us more about what they were discovering, this was effectively pigeonholed. It was a little local interest story. As I say, it fell off our screen. It fell off our screen until 5,000 people found themselves gasping for breath under the streets of Tokyo.

Let me say quite clearly that this is not an argument in favor of assigning our intelligence assets to investigations of everything that happens everywhere in the world, nor am I suggesting that we should be spying on the domestic affairs of our allies. In the first case we cannot, and in the second we should not. But to have missed an event this large and this significant, and then to have consigned it to the status of an Oriental curiosity, given the avowed interest on the part of our political and military and security leadership in preempting terrorism, is simply not acceptable.

The decision to allow the Japanese authorities to investigate was the correct one. The hope of reviewing their findings was logical. But when no report was forthcoming, we should have insisted on being briefed in. And if that didn't work—and I acknowledge the reluctance of Tokyo to discuss this embarrassment openly—we should have examined our other options.

One of which, by the way, might have been simply to read the Japanese newspapers and magazines that continued to pound away at the Matsumoto story right up to this year's subway attack. Certainly cables were sent from our Embassy. And, Senator Lugar, your question is right on the money: Was anybody reading them?

When I went to Japan last year, it didn't take more than a few days to conclude that something ominous had indeed happened, with implications that had to reach the United States. I had no idea at that time how complex the truth was, but I knew it was important.

The fifth point, and I say this at the risk of losing some friends in Japan, is that the Tokyo subway attack should never have occurred. I think the evidence is compelling that the Japanese authorities knew the Aum Shinrikyo posed a serious threat certainly weeks, and probably months, before the Tokyo took place.

Two weeks after the Matsumoto attack, critical events took place in the rural community of Kamakuishiki at the foot of Mt. Fuji, which is the headquarters of the Aum Shinrikyo cult. There were two releases of toxic chemicals which were reported by townspeople to authorities. They noted difficulty breathing and strange vision-related ailments. More significantly, they reported seeing people lying on the side of the road outside one of the cult compounds which we would subsequently learn was the infamous Satyam 7, the site of their hidden chemical weapons production facility.

We heard before that the cult produced the Matsumoto nerve gas at Satyam 7 and then probably discontinued work there because of an accident. The indications are rather clear that the events in

Kamakuishiki in July which left people in difficulty, with labored breathing, which left members of the cult lying by the side of the road, were indeed related to that accident.

The incident in July was promptly investigated by Japanese authorities, yet they did not release their findings, which included discovering the presence of sarin, until January 1 of this year. Why the delay? And why issue the news on a holiday when it wouldn't be noticed?

One can speculate that upon establishing that there might be a tie-in with the cult, owners of the only large-scale industrial facilities in Kamakuishiki, police undoubtedly might have followed up by learning that the cult's leadership was in Matsumoto the weekend before the Monday, June 27, 1994 attack. They might have been expected to find some links between the cult and the three judges who were the apparent targets of that first attack.

Combined with the almost constant stream of cult propaganda, in which they openly talked about sarin in almost mystical terms, it is difficult to believe that the police were unable to make the same connections that a variety of investigative reporters were already making. In fact, the cult's involvement was widely rumored on the streets in December of 1994, at the time of my first visit there.

The fact that Asahara apparently ordered the subway attack upon learning from moles within the military (and probably the police) that the authorities were finally preparing to raid the sect is a remarkable reflection on the ability of the cult to gather information and act on it. The other side of the coin is that, despite having all the facts listed above, as well as many others at their disposal, the Japanese Government was ultimately unable to move in a timely enough fashion to protect its civilian population.

Senator NUNN. Mr. Olson, if I could interrupt there, how much of this reticence or reluctance or delay in coming to grips with this on the part of the Japanese authorities do you believe was related to the very sensitive question of religion and Japanese culture and society and the protections that had been built in to protect religions, in effect, since General MacArthur helped the Japanese create a new government after World War II and new constitutional protections?

Mr. OLSON. Undoubtedly, the constitutional and cultural reasons behind the police's inaction were significant. They were substantial. The fact that the system is different from ours is one that I acknowledge right up front. I think that the Japanese police did a remarkable job of investigation. I think the Japanese authorities have been diligent in their pursuit of this matter. But the fact remains that the information was out there. For whatever reason, the preventive actions could have been taken; actions should have been taken earlier.

The fact remains the Aum Shinrikyo was not very adept at concealing its presence nor its involvement. If a group can leave a footprint this big and operate with as free a hand as this cult enjoyed, what does that say about the potential of smaller, more disciplined organizations?

Let me just summarize, Senator. Thank you for your indulgence. I thank the indulgence of the Committee. The story of the Aum

Shinrikyo reads like a sensational novel, and yet it is true. Some of the most astounding details are probably not even on the table yet. But it is a story that is a cautionary one in nature. There are a lot of lessons to be learned and many actions to be taken to try to minimize the chance of the story being repeated.

But a demoralizing truth may well be that whether or not we take appropriate steps, the lessons of the cult are being studied and taken to heart by those who would seek to surpass their teachers. The age of super-terrorism appears to be upon us; and if so, our best defense is knowledge. That is why reopening this matter today is so important.

I salute the Members of the Subcommittee for focusing their attention on this case and for recognizing the greater dangers to which it alerts us. I look forward to answering any of your questions at the end of this panel.

Thank you.

[The prepared statement of Mr. Olson follows:]

PREPARED STATEMENT OF MR. OLSON

Thank you, Mr. Chairman, for the opportunity to speak with the Members of the Subcommittee this morning. I am a member of the Senior Staff at TASC, Inc. and its Arms Control and Proliferation Analysis Center in Rosslyn, Virginia. In that capacity, I work on chemical and biological arms control, counterproliferation, and counterterrorism issues for government and private sector clients here and abroad.

It is with very little pleasure that I am able to say that the March 20 subway attack did not come as a surprise; in fact, it realized a concern I had known for several months. I visited Japan in December of last year to investigate the June 27, 1994 Matsumoto sarin attack. As you know, that first attack received little attention outside Japan. I first became aware of it some 3 months afterwards when I was asked by the Nippon Television Corporation to serve as a consultant on a broadcast they were preparing. As I looked into the case, I found myself astonished by my own discoveries. It was my firm belief that the seven Matsumoto dead had been the victims of a terrorist attack. I also believed, based on several factors, that this had been more a field test than a full-blown strike.

I concluded that an organized terrorist group had—for the first time—demonstrated the ability and willingness to use a weapon of mass destruction. It was clear to me that the persons behind that first attack would likely strike again, and that the next target would be much higher profile. In my report, circulated in this country in January of this year, I also pointed out the symbolic and tactical vulnerability of the Tokyo subway system at rush hour to a nerve gas assault.

I have revisited Japan some half dozen times since that tragic Monday. I have had the opportunity to speak with members of the Aum Shinrikyo, with victims of the attacks in Matsumoto and Tokyo, with residents of Kamakuishiki. I have examined the mountain caches of highly toxic chemicals and seen police divers recovering pieces of assault weapons tossed into reservoirs north of Tokyo. I have even had the dubious pleasure of receiving telephone calls at home from the cult's offices in Tokyo, inviting me to visit their country.

In short, I have been well and truly engaged in this case longer than most people in this room even knew there was a case. Many, if not all of my factual findings have been shared with your staff. As a result, I will not consume this body's time restating the many intriguing and sometimes astounding details that have been so well presented in the staff report.

Instead, I would like to address the lessons that we should take away from the story of the "Doomsday Cult".

If this were simply the tale of an isolated band of religious extremists on the other side of the world, it would be one thing. In fact, while the tragedy in Tokyo, and the one before it in Matsumoto, would be lamentable, I might question whether this would be a moot topic for this Subcommittee. But this is clearly much more than a Halloween story.

The Aum Shinrikyo's acquisition and use of chemical weapons, and their plans and efforts to acquire other WMD for use in promoting even greater horror, touches on a host of issues of critical importance to this country and to the international community as we strive to make sense of an unexpectedly changing world. This Subcommittee should be applauded for casting its light on these questions. The story of the cult's multinational reach and apparent success in pursuing its agenda without outside interference—or detection—demands scrutiny even without the broader context. The Aum Shinrikyo is a case study in the potential of modern terror. We must study it for the lessons it teaches.

I. The Threat of Terrorist Use of Weapons of Mass Destruction has Never Been Greater, and It Is Increasing

The first and most immediate of these lessons is that the world has become a more dangerous place. The U.S. State Department has concluded that while the total number of terrorist attacks has gone down over the last 5 years, each attack has, on average, become more deadly. While the end of the Cold War may have contributed to this reduction, by eliminating some of the state sponsorship enjoyed by violent groups during the 70's and 80's, those organizations that remain appear to be more bloodthirsty than ever.

The decision by the Aum Shinrikyo to pursue weapons of mass destruction, and moreover their relative success in that pursuit, is the logical extension of that trend. As has been noted here, the nightmare of terrorists with chemical, biological, and nuclear weapons has been realized. I would argue that given the trend toward escalating violence by sub-national groups, as evidenced by the State Department survey and by numerous studies of terrorist psychology, this is not a nightmare that is likely to disappear when we turn on the lights. To the contrary, the line in the sand has been irrevocably erased.

From a security planning perspective, I believe we must assume we have entered a world in which the chemical and biological, and perhaps even the nuclear, cards are in terrorists' hands. I do not believe it is coincidental that in the weeks after the Tokyo attack, terrorists in the Phillipines and in Chile both threatened the use of chemical weapons.

II. We Do Not Have An Effective Defense Against WMD Terrorism

We must also confront another sobering truth. We do not presently have the capability in place to defend our cities against a clandestine attack involving chemical and biological weapons. In the case of biological weapons, it is unlikely we would even know we had been attacked until people began to fall. We do not have adequate vaccines on hand, nor do we have adequate planning in place at the local, State, and Federal levels to manage the effects of even a small, relatively unsophisticated BW attack. We would probably fare somewhat better against CW, but more because of the localized nature of the weapon's effects than because of any efforts on our part.

The Department of Defense has begun to recognize the BW threat, and has devoted some effort to the problems of detecting and countering biological threats, particularly against our forces in the field. These efforts should be accelerated by this Administration as a means of assuring that at least our first line of defense is able to operate in face of this threat. Effective military defenses, including a viable vaccine production and stockpiling program, could serve as the foundation for a meaningful civilian defense program at some point down the road.

In the absence of a commitment to civilian defense, the only organized response we can realistically hope to offer the victims of a terrorist BW attack is a form of triage: Bury the dead, comfort the wounded, and pray for the survivors.

III. CW and BW Do Not Constitute High Technology Anymore

The cult attacks in Matsumoto and Tokyo were not—I repeat, were not—technically sophisticated. You may recall a number of military specialists in chemical weapons stated their opinion at the time of the subway attack that they did not believe sarin had been used. The number of fatalities seemed to be much too low, and certain other aspects, such as the smells that we now attribute to impurities and other chemicals mixed into the "cocktail", were inconsistent with sarin as the military thought of it. The experts were confused because the cult indeed got a lot of it wrong when they cobbled the subway attack together; perhaps if the Aum Shinrikyo had taken more than one weekend to come up with their plans they might have been able to put together a more technically impressive show.

But the lesson here is that these weapons are so dangerous that even when you get them wrong they work. Much has been made of the cult's scientific capabilities. I think it would be a mistake to focus so much on this that we discount the danger from other groups that don't recruit from Tokyo University. The technology of CW is fifty-to-sixty years old, and the actions of the Aum Shinrikyo should be viewed as a bloody roadmap for would-be acquisitors. Chemical weapons, at the least, are within the reach of any group prepared to pick up the newspapers and read about how it was done in Japan, certainly including a number of organizations hostile to the United States.

One of the bits of good news, if there is some here, is that the cult never really seemed to master the dark art of biological weapons. That they produced deadly toxins seems beyond question. They certainly had a dedicated laboratory as early as 1990, in which they produced biological toxins. They reportedly laced foods with biotoxins and served them to cult members who fell from favor. They attempted to acquire the Ebola virus for possible use as a terror weapon. And they released biological toxins in Tokyo at least twice. Fortunately, other than cult members themselves who may have ingested the toxins, it would appear that no one was injured by these weapons.

It is somewhat reassuring to conclude that while culturing biological agent organisms is easy, weaponizing their toxins is still somewhat difficult. Asahara himself reportedly grew angry and frustrated when the toxins, sprayed as an aerosol, failed to kill guinea pigs in the cults Kamakuishiki laboratory.

Unfortunately, most assessments suggest that the cult's mistakes would be relatively simple to correct; furthermore, their deliberate use of biological weapons on the busy streets of Tokyo and in its crowded subways—even ineffectively—should serve notice that the taboo against such weapons has lost its potency. It seems clear that the Aum Shinrikyo's BW research has established something of a foundation upon which other groups will build.

IV. OUR INTELLIGENCE COMMUNITY FAILED

To say that the Aum Shinrikyo "wasn't on [their] radar screens" prior to the Tokyo attack says some rather unflattering things about our intelligence community. The Matsumoto attack was the biggest news story in the second most powerful nation in the world for weeks. It constituted the first non-military use of nerve gas, and was a precedent-shattering terrorist event. Tens of thousands of Americans live and work in Japan, including, of course, elements of our armed forces.

Yet after a brief flurry of interest because of the sarin element, this case was apparently classified as a domestic Japanese issue. Instead of committing some resources to learning more, we deliberately decided to wait for the Japanese authorities to share their findings with us. And so waited. And waited. And waited. And eventually, this little pigeon-holed, local interest story fell off the screen. Until 5,000 people found themselves gasping for their lives in the Tokyo subway on March 20.

Let me say quite clearly that this is not an argument in favor of assigning our intelligence assets to investigations of everything that happens anywhere in the world, nor am I suggesting we should spy on the domestic affairs of our allies. In the first case we can not, and in the second we should not. But to have missed an event this large, and then to have consigned it to the status of an oriental curiosity, given the avowed interest on the part of our government leaders in preempting terrorism, is simply not acceptable.

The decision to allow the Japanese authorities to investigate, and then to review their findings was probably correct, as far as it went. But when no report was forthcoming we should have insisted on being briefed in. And if that didn't work—and I acknowledge the reluctance of Tokyo to discuss this embarrassment—we should have then examined our other options.

One of which, by the way, might have been to read the Japanese newspapers and magazines that continued to pound away at the Matsumoto story right up until this year's subway attack. Certainly cables must have been sent from our embassy. Didn't anyone bother to read them?

When I went to Japan last year, it didn't take more than a few days to conclude that something ominous had happened, with implications that certainly reached to the United States. I had no idea how complex the truth was, but I knew that it was important.

How could our intelligence services, the very people we depend upon to protect us from terrorist threats, not have seen the same thing unless they simply weren't looking?

V. THE TOKYO SUBWAY ATTACK SHOULD NEVER HAVE HAPPENED

The evidence is compelling that Japanese authorities knew the Aum Shinrikyo posed a serious terrorist threat months before the subway attack. Two weeks after the Matsumoto attack critical events took place in the rural community of Kamakuishiki which undoubtedly focused police attention on the cult. This collection of small hamlets and farms at the foot of Mount Fuji experienced not one but two releases of a toxic chemical authorities would determine contained sarin.

Townspeople complained of difficulty breathing and strange vision-related ailments. More significantly they reported seeing people lying by the side of the road near one of the compounds belonging to the Aum Shinrikyo. The cult in fact had built a chemical weapons factory in one of their buildings, the infamous Satyam 7, and had conducted experimental production of sarin there. Accidents, which injured a number of followers, are almost certainly the sources of the releases that prompted the townspeople's complaints.

The incident in July was promptly investigated, yet authorities did not release the information about sarin until January 1, 1995. Why the delay, and then why issue the news on a holiday, when it would not be noticed?

Upon establishing that there might be a tie-in with the cult, police undoubtedly would have learned that the cult's leadership was in Matsumoto the day before the attack there. They might also have been expected to find the links between the cult and the three judges involved in adjudicating the land dispute that apparently triggered the sarin attack.

Combined with the almost constant stream of cult propaganda about sarin—which believe it or not used to be a rather obscure chemical in most circles—it is difficult to believe that the police were unable to make the connections that a variety of investigative reporters were making. In fact, the cult's involvement was widely rumored in December of last year, at the time of my first visit there.

The fact that Asahara apparently ordered the subway attack upon learning from moles within the military and police that the authorities were preparing to raid the sect is a remarkable reflection on the ability of the Aum Shinrikyo to gather information and act upon it. The other side of the coin is that despite having had all the facts listed above, as well as many others, the Japanese Government was ultimately unable to move in a timely enough fashion to protect its citizens.

Undoubtedly, there are a number of constitutional and cultural reasons why this was the case. In fact, there is probably at least one good doctoral dissertation in such a study. But the fact remains that the Aum Shinrikyo was not very adept at concealing its presence nor its involvement. If a group can leave a footprint this big and operate with as free a hand as this cult enjoyed, what does that say about the potential of smaller, more disciplined organizations?

SUMMARY

The story of the Aum Shinrikyo reads like a sensational novel, and yet it is true. Some of the most astounding details may not yet be on the table. But if it is a remarkable story, it is also a cautionary one. There are many lessons to be learned, and many actions to be taken to try to minimize the chance that another such tale will be told.

But a demoralizing truth may well be that whether or not we take the appropriate steps, the lessons of the Doomsday Cult will be studied and taken to heart by those who may well seek to surpass their teachers. The age of super-terrorism may well be upon us; if so, our best defense is knowledge. That is why reopening this matter today is so important.

I salute the Members of the Subcommittee for focusing their attention on this case, and for recognizing the greater dangers to which it alerts us. I look forward to answering any questions.

Senator NUNN. Thank you very much, Mr. Olson. We will have some questions. We will go through our panel first if that is all right with you, Senator Cohen and Senator Lugar.

Dr. Eitzen?

TESTIMONY OF LT. COL. EDWARD M. EITZEN, JR. M.D., M.P.H., CHIEF, PREVENTIVE MEDICINE DEPARTMENT, MEDICAL DIVISION, U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES

Dr. EITZEN. Mr. Chairman, distinguished Members of the Subcommittee, it is a great honor to appear before you to address the possible impact of terrorist use of biological agents as weapons against the citizens of the United States. Limiting the effectiveness of biological weapons of mass destruction presents a compelling challenge to our Nation which should be taken very seriously.

My qualifications to speak to you on this issue include my service for the past 4 years as Chief of the Preventive Medicine Department at the U.S. Army Medical Research Institute of Infectious Diseases, also known as USAMRIID. USAMRIID is the primary Army research facility concerned with medical and biological defense for our government.

As a physician, my primary expertise lies in the area of medical defense against biological agents and not in offensive aspects of the use of these agents as weapons.

Biological warfare, or BW, is the intentional use of microorganisms or of toxins derived to produce death or disease in humans, animals, or plants. Biological warfare threat agents fall into three major categories: Bacteria, viruses, and toxins.

Bacteria are single-celled organisms that cause disease by either invading body tissues or by elaborating toxins which have detrimental effects on human beings. Anthrax is an example of a bacterial threat agent. Diseases caused by bacteria often respond to specific treatment with antibacterial drugs commonly known as antibiotics.

Viruses are much smaller organisms which consist of genetic material, either DNA or RNA, surrounded by a protective layer. Viruses must invade the cells of an infected person in order to cause disease. Smallpox is an example of a viral threat agent. The diseases which are produced by viral agents are more difficult to treat, but may respond to specific antiviral drugs. Whereas there are many antibiotics available to treat disease caused by bacterial threat agents, very few antiviral drugs are available for human use.

Toxins are poisonous substances which produce adverse clinical effects, known as "intoxication," in humans. The botulinum toxins, which are among the most toxic substances known, are an example of a group of several similar toxins which are considered to be threat agents. The adverse effects of toxins may be lessened by treatment with antitoxins, which are antibodies directed against specific toxin agents. Botulinum antitoxin is an example of a specific antitoxin which is available to decrease symptoms of botulinum poisoning.

In addition to use of antibiotics and antitoxins, pre-exposure immunization with vaccines can also provide protection against many bacteria, viruses, and toxins. Some characteristics of BW, or biological warfare, agents which make them dangerous weapons include the following: They may be dispersed in an aerosol cloud, with such clouds being invisible because of the particle size of the aerosol being extremely small, on the order of 1 to 5 micron in size; they are odorless and tasteless; they are relatively inexpensive to produce; they require considerably less technical expertise to produce compared to other weapons of mass destruction; the technology for their dissemination may be more easily available off the shelf; they can spread downwind over very large areas; and, finally, they are difficult to detect in the environment.

A number of biological agents could be used to attack susceptible populations. Some are lethal agents, producing death in a certain percentage of victims of the attack, whereas others may only incapacitate. Examples of potentially lethal agents include anthrax, tularemia, botulinum toxins, plague, smallpox, hemorrhagic fever viruses, and the toxin ricin. Examples of agents which usually only cause incapacitation or illness are "Q" fever and Staphylococcal Enterotoxin B, also known as SEB.

The effects of biological threat agents on humans vary with the particular agent used. Anthrax and botulinum toxins are two agents which could be disseminated by the aerosol route and be inhaled.

With anthrax, early signs and symptoms would include fever, malaise, and chest pain in the first 24 to 48 hours after exposure. Within 3 to 5 days, however, exposed individuals would become severely ill, rapidly developing shortness of breath and shock, and many would die within the next 24 to 48 hours.

With botulinum toxins, persons exposed would begin developing weakness and visual difficulties as early as 24 to 36 hours after exposure. These early symptoms would be followed by difficulty with speaking and swallowing, followed by weakness of arm and leg muscles, and finally by paralysis of respiratory muscles and resulting suffocation unless intensive medical care is provided. This is the clinical syndrome commonly known as botulism. In modern medical facilities, the case fatality rate for botulism is less than 5 percent with good intensive care; however, patients may require extensive care for long periods of time before they recover.

Other biological agents such as plague, "Q" fever, and tularemia would normally produce lung infections, whereas inhaled toxins such as ricin or SEB would also cause breathing difficulties. For some of these agents, particularly those caused by bacteria, antibiotic therapy is available and might be life-saving.

Biological agents would not be difficult for terrorist groups to acquire, and knowledge of microbiology and its potential applications is widespread. A terrorist attack using an aerosolized biological agent could occur without warning, and the first sign of the attack might be hundreds or even thousands of ill or dying patients since biological clouds are not visible. Because the time before onset of symptoms with some biological agents can be as long as several days, the actual attack may be long over and the perpetrators gone by the time casualties begin to occur.

A civilian biological attack scenario might differ in several aspects from a threat to military forces in the field. Because civilian populations are not immunized against most BW agents, it has been estimated that casualty numbers could be very high. These estimates assume, however, that a terrorist group could produce and disseminate a BW agent in exactly the right particle size under perfect weather conditions and that a number of other factors would fall into place. It would be technologically somewhat difficult for a terrorist group to produce a biological agent in exactly the right particle size for inhalation. This would require a level of sophistication possessed by some state-sponsored offensive biological warfare programs.

Other possible problems we would see from a terrorist attack might include the lack of adequate hospital beds to treat all the casualties, deficiencies of needed medications, and the fact that many civilian health care providers have not been trained to recognize and treat BW agent casualties.

Medical countermeasures against many of the biological threat agents are available. These include vaccines, antibiotics, and antitoxins. In situations where susceptible humans can be identified in advance of an actual attack, immunization with vaccines before exposure can prevent illness. However, large-scale vaccination of civilian populations, as can be done in at-risk military forces, is probably not feasible. However, post-exposure treatment with antibiotics, certain vaccines, antitoxins, and supportive care can and will have to be relied upon. Pre-placement of adequate antibiotics and vaccine stocks with the ability to rapidly transport such pharmaceuticals to the area of an attack is, therefore, critical.

Training of civilian health care providers in localities that are likely to be targets of terrorists is also extremely important. Such training is necessary so that early treatment measures would be more effective. Most physicians do not see and treat illnesses such as anthrax and botulism in their daily practices.

The United States is vulnerable to a terrorist attack with biological weapons. Biological weapons offer terrorists inexpensive weapons of mass destruction. The effects of the use of biological agents in this country are potentially devastating. Continued vigilance against this threat, to include close coordination between Federal, State, and local planners, adequate resources for education of medical professionals and first responders, and continued support of programs to develop medical countermeasures and diagnostics, is the only prudent course of action.

Mr. Chairman, this concludes my prepared testimony to the Committee. I thank you for the opportunity to represent the many dedicated service members, medical professionals, and scientists who work daily to defend our country against the threat posed by biological weapons.

[The prepared statement of Dr. Eitzen follows:]

PREPARED STATEMENT OF DR. EITZEN

Mr. Chairman, distinguished Members of the Committee, it is my great pleasure to appear before you to address the possible impact of terrorist use of biological agents as weapons against the United States and its citizens. Limiting the effectiveness of biological agents as weapons of mass destruction presents a compelling challenge to our nation.

My qualifications to speak to you on this issue include my service for the past 4 years as Chief of the Preventive and Operational Medicine Department at the Army's biological defense laboratory at Fort Detrick, Maryland, the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID), a subordinate unit of the U.S. Army Medical Research and Materiel Command. USAMRIID is the primary Army laboratory concerned with medical biological defense. At USAMRIID, my department serves as a liaison between USAMRIID and military units, other military services, U.S. Government agencies, allied governments, and others who use the knowledge, vaccines, and drugs developed there for defense against biological weapons. I am also the director of the Army's "Medical Defense against Biological Warfare" course taught four times yearly at Fort Detrick for military healthcare providers, and have also taught in the biological defense courses of the United Kingdom, Canada, and Australia. In addition, I am the co-author of the "Medical Management of Biological Casualties Handbook" developed at USAMRIID, as well as the author of two textbook chapters on medical biological defense in an upcoming volume of the *Textbook of Military Medicine*. My position at USAMRIID has given me the chance to serve on numerous interagency, national, and international bodies which respond to or deal with issues of biological warfare and terrorism. My medical qualifications include board certification in the specialties of Emergency Medicine, Pediatrics, and Preventive Medicine. Finally, I am a veteran of Operations Desert Shield and Desert Storm and have been involved with biodefense programs since that time. After Desert Storm, I was a member of the first United Nations team to inspect the biological weapons program of Iraq, in August of 1991. My primary expertise lies in the area of medical defenses against biological agents.

Biological warfare (BW) is the intentional use of microorganisms, or of toxins derived from living organisms, to produce death or disease in humans, animals, or plants. Biological warfare threat agents fall into three major categories: Bacteria, viruses, and toxins.

Bacteria are single-celled organisms that cause disease by either themselves invading body tissues, or by themselves elaborating toxins which have detrimental effects on human beings. Anthrax (*Bacillus anthracis*) is an example of a bacterial threat agent.. Diseases caused by bacteria often respond to specific treatment with antibacterial drugs known as antibiotics. Penicillin and ciprofloxacin are examples of antibiotics which are effective against some bacteria.

Viruses are much smaller organisms which consist of genetic material (DNA or RNA) surrounded by a protective, coat that facilitates transmission between cells. Viruses must invade host cells in order to multiply and cause disease. Smallpox is an example of a viral threat agent. The diseases produced by viral agents are more difficult to treat, but may respond to specific antiviral drugs or specific antibodies directed against the virus causing the illness. Whereas there are many antibacterial drugs available to treat disease caused by bacterial threat agents, very few antiviral drugs are available for human use. When bacteria or viruses invade the human body, this is known as an "infection". Bacteria and viruses are often called "replicating" agents due to the fact that they are able to reproduce and multiply either inside the human body or in appropriate culture media or tissue culture systems.

Toxins are poisonous substances made by living organisms (or synthetically) which produce adverse clinical effects (known as "intoxication") in humans or other animals. The botulinum toxins, which are among the most toxic substances known, are an example of a group of similar toxins which are considered to be threat agents. The adverse effects of toxins may be lessened by treatment with antitoxins, which are antibodies, directed against specific toxin agents. Botulinum antitoxin is an example of a specific antitoxin which may preclude or decrease symptoms of botulinum intoxication. Toxins are not living organisms, but rather cellular by-products, and therefore they do not replicate. Biological toxins also are not generally persistent or volatile: They do not therefore produce a persistent vapor hazard in the environment, unlike some chemical agents.

The usual characteristics of biological threat agents which make them potential weapons of mass destruction include: They may be dispersed in an aerosol cloud, with such clouds being invisible to the human eye because the particle size of the aerosol is extremely small (on the order of 1 to 5 micrometers or microns in size); they are odorless and tasteless; they are relatively inexpensive to produce compared to production of conventional, nuclear, or chemical weapons; they require considerably less technical expertise to produce compared to other weapons of mass destruction; the usual technology for delivery of biological threat agents may be available off the shelf, and may be as simple as a modified agricultural sprayer or other spray device which could be mounted on an airplane, boat, car or other conveyance; they can spread downwind over very large areas if disseminated properly under ideal weather conditions of inversion and low wind speeds; they spare physical structures and terrain features but still can kill persons within such structures; finally, they are difficult to detect in the environment. An epidemic caused by biological threat agents could create fear, and even terror and panic in a susceptible population, in addition to massive numbers of casualties.

Although the primary route of exposure to a biological attack would be by the aerosol route with inhalation of the agent, an adversary or terrorist could possibly use biological threat agents to contaminate food or water supplies and cause infection or intoxication by the oral route. Attempts to contaminate a large water supply such as a reservoir with biological agents or toxins would be difficult due to the dilution effect as well as due to normal water purification methods such as chlorination. Contaminating smaller water supplies or directly contaminating water near the end user might be more effective ways of delivering biological agents via the oral route of exposure. Exposure through the skin or by intentional injection is also possible, but considered to be less likely. This route has been and might be used again in assassination attempts. Infection or intoxication with biological agents or toxins is not likely through intact skin, as human skin provides an excellent barrier against infection. This is a significant difference from some chemical agents such as VX, which can cause effects with skin exposure.

A number of biological agents could be used to attack susceptible populations. Some are lethal agents (produce death in a certain percentage of victims of the attack), whereas others may only incapacitate the victims of the attack (make them very ill). Examples of potentially lethal agents include anthrax, tularemia, botulinum toxins, plague, smallpox, hemorrhagic fever viruses, and the toxin ricin. Examples of agents which usually only cause incapacitation are Venezuelan Equine Encephalitis (VEE) virus, Q Fever, and Staphylococcal Enterotoxin B (SEB). Although incapacitating agents may not be lethal, they may cause a great deal of illness.

The effects of biological threat agents on humans vary with the particular agent used. Many BW agents produce clinical syndromes similar to those seen in nature with the same agents. Clinical signs and symptoms can also vary with a given agent according to the route by which a person is exposed (through the skin, by ingestion, or by inhalation). With aerosol exposure to anthrax, early signs and symptoms would include fever, malaise, and nonspecific chest symptoms such as chest pain, and possibly cough, the first 24 to 48 hours after exposure. Within 3 to 5 days, however, exposed individuals would become severely ill, rapidly developing shortness of breath and shock, and would die within the next 24 to 48 hours. The case fatality rate as a percentage of those exposed with inhalation anthrax is estimated at 85 to 90 percent.

With botulinum toxins, persons exposed would begin developing weakness and visual difficulties from about 24 to 36 hours to several days after exposure, depending on the dose of toxin inhaled. These early symptoms would be followed by difficulty with speaking and swallowing, then by weakness of extremity muscles, and finally by paralysis of respiratory muscles and suffocation unless intensive supportive care such as ventilatory assistance is provided. This is the clinical syndrome commonly known as botulism. In modern medical facilities the case-fatality rate for botulinum intoxication or poisoning is less than 5 percent with good intensive care; however, patients may require extensive care for an extended period (weeks) before they recover.

Other biological agents such as plague, Q fever, ,and tularemia would normally produce severe pneumonia (lung infections), whereas toxins such as ricin or SEB would also cause breathing difficulties if inhaled. Our ability to treat these patients would depend on the agent inhaled: For some, particularly those caused by bacteria (plague, Q fever, and tularemia), specific antibiotic therapy is available and might be life-saving.

A civilian biological attack scenario might differ greatly from a threat to military forces in the field, for several reasons. A terrorist attack using an aerosolized biological agent might occur without warning, and the first sign of the attack might be hundreds or thousands of ill or dying patients since biological clouds are not visible. Because incubation periods with biological agents can be as long as several days, the actual attack may be long over and the perpetrators may have left the area by the time casualties begin to occur.

Because civilian populations are not immunized against most BW agents, and because they do not have means to protect themselves physically (filtered respirators or "gas" masks), casualty numbers might be very high indeed. A report published by the World Health Organization in 1970 estimated that if 50 kilograms of anthrax spores were dispensed upwind of a population center of 500,000 people in optimal weather conditions, almost half of the population of that area would be either disabled or killed in such an attack, as shown in the following table:

Hypothetical Dissemination by Airplane of 50 kg of Agent Along a 2 km line Upwind of a Population Center of 500,000 People *

Agent	Downwind Reach (km)	Dead	Incapacitated
Rift Valley Fever	1	400	35,000
Tick Valley Enceph	1	9,500	35,000
Typhus	5	19,000	85,000
Brucellosis	10	500	100,000
Q Fever	>20	150	125,000
Tularemia	>20	30,000	125,000
Anthrax	>>20	95,000	125,000

* Health Aspects of Chemical and Biological Weapons, WHO, 1970.

In addition to producing potentially massive numbers of casualties, other problems from a biological terrorist attack might include the lack of adequate hospital beds to treat all the casualties, deficiencies of special medications and antitoxins needed to treat casualties, the fact that many civilian health care providers have not been trained to recognize and treat BW agent casualties, and the possibility that many of the local healthcare providers may have been exposed themselves during the attack and are also ill.

How might a terrorist dispense a biological agent on a target population? Biological agents might be released by a number of basic methods, most of which revolve around the aerosolization of the agent.

Other types of delivery systems for biological agents have been designed by various countries with state-sponsored BW programs. These include bombs or bomblets which release the agent by exploding (generally very inefficient delivery systems), land and sea mines, pipe bombs, and other special devices.

Clandestine BW delivery means are also potentially available to terrorists. Examples include devices which penetrate and carry the agent into the body through the skin, such as pellets or flechettes, or means to contaminate food or water supplies so that the agent would be ingested.

Biological agents may be delivered in either wet or dry form. Dry powders composed of very small particles tend to have better dissemination characteristics, and have advantages in terms of storage and handling. Dried agents require an increased level of technological sophistication to produce, although the technology to do such procedures as freeze drying or spray drying has been available in industry for a number of years. It would be technologically difficult for a terrorist group to produce a dry biological agent in the right particle size for inhalation. This would require a level of sophistication possessed by some state-sponsored offensive biological warfare programs. It is possible, however, that some groups have this level of expertise or could obtain support from a country which has an offensive BW program.

The materials needed to make biological agents are not always difficult for terrorist groups or countries to acquire. For example, Iraq purchased seed stocks that could be used to make biological agents from a U.S. commercial culture collection early in the development of their BW program. There have been several other attempted purchases of these types of agents historically, some recently. Some agents could also be harvested from animals which are infected and die from the diseases they cause in nature.

Knowledge of microbiology and its potential applications is widespread. There are numerous people with the technical knowledge necessary to develop crude biological weapons. While cutting edge biotechnology research requires an infrastructure of sophisticated laboratories, and production of sophisticated biological weapons may require specialized equipment, some effective biological pathogens or toxins may be produced or harvested using relatively primitive techniques. Cases of attempted biological sabotage have occurred within U.S. borders on several occasions. Even an attack which turned out to be a hoax had significant public impact: The case of a Fairfax, Virginia man who in 1992 sprayed his neighbors with a fluid he claimed contained anthrax is illustrative. This incident resulted in the deployment of local hazardous material teams, the quarantine of the house involved, and numerous patients presenting to the local hospital emergency department for care. A larger scale incident could potentially create a panic, and cause hundreds or even thousands of people to seek medical care.

The potential impact on health care facilities in the area of an attack or a threatened attack is tremendous. Emergency departments may experience tremendous backlogs of patients, open hospital beds may become scarce, intensive care units may be filled, and antibiotic stocks may be depleted.

The possible scenarios for criminal or terrorist attacks with biological agents fall into four basic types: Product tampering as in the Tylenol tampering cases of the 1980's; attacks on specific population groups within the United States which are perceived to be antagonistic to terrorist goals; sabotage of specific food groups or industries, such as contamination of an imported food product with a toxin or with pathogenic bacteria (as in the Chilean grape tampering case); or attacks directed at a U.S. city or a representative institution of the United States (a political, military, or economic target).

Because of the variety of possible scenarios and the likely similarity of the medical effects of such attacks to many endemic disease situations, medical care providers would have to be extremely alert to differentiate the initial cases resulting from BW terrorism from a natural disease outbreak.

Biological terrorism could range from the use of sophisticated BW weapons such as dried anthrax spores or botulinum toxins, to unsophisticated agents such as Salmonella or other common bacteria. The agent used and the mechanism of delivery may depend to a great extent on whether the terrorist or terrorists have the sponsorship of a state or government hostile to the United States. A state-sponsored terrorist group is, however, much more likely to have the wherewithal to produce casualties on a large scale, whereas the unsupported single operative may still have a significant impact, but on a much smaller scale. The operative question may not be *whether* biological agents will be used as terrorist weapons against the United States, but rather *when* they will be used.

Medical countermeasures against many of the biological threat agents are either available now or currently being developed. These include vaccines, antibiotics, and antisera. In situations where at-risk humans can be identified in advance of an actual attack using biological agents, immunization before exposure with specific vaccines provides protection from bacterial or viral infections, or from toxin poisoning. Large-scale vaccination of civilian populations against biological threat agents, as can be done in at-risk military forces, is probably not feasible. Post-exposure treatment with antibiotics, certain vaccines (such as anthrax and smallpox vaccines), antitoxins, and supportive care will have to be relied upon. Specific treatments which may be effective include: Penicillin, doxycycline, or ciprofloxacin combined with anthrax vaccination in the case of anthrax; streptomycin or tetracyclines for tularemia; doxycycline for plague; and botulinum antitoxins for botulinum poisoning. Pre-placement of adequate antibiotic and vaccine stocks with the ability to rapidly transport such pharmaceuticals to the area of an attack is therefore critical. Also critical is the maintenance of a continuing reference laboratory capability, as is available within the Department of Defense, for diagnosis of disease caused by biological warfare agents.

Early epidemiologic analysis of a suspicious outbreak of disease, with early diagnosis and treatment of persons already ill and others in the area of the attack (who are not yet symptomatic) will be necessary. Training of civilian healthcare providers in localities that are likely to be targets of terrorists is also extremely important. Such training programs are needed to familiarize health workers with biological threat agents so that early treatment measures would be more effective. Most physicians do not see and treat diseases or intoxications such as anthrax and botulism in their daily practices.

The United States is vulnerable to a terrorist attack with biological weapons. Biological weapons offer potential adversaries or terrorists weapons of mass destruction that can be produced easily and cheaply. The cost advantage of biological weapons was clearly illustrated by a 1969 United Nations report which estimated the relative cost of operations against civilian populations at $1 US/Km2 (square kilometer) for biological weapons, versus $600/Km2 for chemical, $800/Km2 for nuclear, and $2,000/Km2 for conventional armaments.

The low cost, availability, relative technological feasibility compared to other weapons of mass destruction, ease of dissemination, difficulty of detection, deniability, and ability to cause mass casualties all make biological weapons very attractive weapons of mass destruction. The effects of the use of biological agents in this country are potentially devastating. We must continue to prepare to defend against and mitigate the effectiveness of these horrific weapons.

Mr. Chairman, this concludes my prepared testimony to the Committee. I thank you for the opportunity to appear before you and represent the many dedicated service members, medical professionals, and scientists who work daily to defend our country both now and in the future against the threat posed by biological weapons.

Senator NUNN. Thank you, Dr. Eitzen, for your testimony and all of your assistance.

Mr. Genovese?

TESTIMONY OF JAMES A. GENOVESE, CHIEF, CHEMICAL/BIOLOGICAL COUNTERTERRORISM TEAM, EDGEWOOD RESEARCH, DEVELOPMENT AND ENGINEERING CENTER, U.S. ARMY CHEMICAL AND BIOLOGICAL DEFENSE COMMAND

Mr. GENOVESE. Thank you, sir. Good morning, Mr. Chairman and members. I am James A. Genovese from the U.S. Army Chemical and Biological Defense Command. It is a pleasure to be with you today to discuss the nature of the threat presented by the use of chemical weapons.

Chemical weapons have been used in warfare for over 2,500 years. The first significant modern-day usage of chemicals as a warfare multiplier occurred during the First World War.

On a glorious day in the spring in Ypres, Belgium, on April 22, 1915, a hissing sound could be heard coming from the German trenches in a sector where British and French forces had joined. That hissing sound was 6,000 chlorine gas cylinders spewing their lethal contents upwind of those Allied Forces.

Those chlorine gas cylinders are very similar to this air cylinder that I am showing you here. The Germans waited patiently for days for the right wind conditions, and when those wind conditions were right, they simply just turned the valve. Three hundred and fifty thousand pounds of chlorine gas fell upon those soldiers on that day.

The following excerpt from McWilliams and Steel's book "Gas—The Battle for Ypres, 1915" describes the horrors of the choking agent chlorine used at Ypres: Shrieks of fear and uncontrolled coughing filled the poisonous air. Terrified soldiers clutched their throats, their eyes staring out in terror and in pain. Many collapsed in the bottom of their trenches and others clambered out and staggered to the rear in attempts to escape the deadly cloud. Those left in the trenches writhed with agony unspeakable, their faces plum-colored, while they coughed blood from their tortured lungs.

Senator, those Allied soldiers were totally unprepared for that chlorine gas attack. Fifteen thousand casualties were reported in the press that day.

Chemical warfare agents are rapidly becoming a major military force in some of the developing countries. These agents can inexpensively provide a substantial psychological edge to a country lacking a viable conventional military capability.

In the war between Iran and Iraq, from 1980 to 1988, the United Nations reports documented the use of chemical weapons by both sides. Over 45,000 chemical casualties were reported.

Chemical warfare agents are chemicals that have direct toxic effects on humans, animals, or plants—with human beings being obviously the major target. There are three methods for producing chemical casualties within human beings: Through inhalation, through skin effects, and through ingestion. These methods are called routes of entry.

The chart that is depicted here gives you an indication of the characteristics of some of these hazards. Some examples of chemical inhalation hazards are hydrogen cyanide, chlorine, and sarin. Hydrogen cyanide is a blood agent which directly inhibits respiration. Chlorine is a choking agent which attacks the lungs and causes severe choking and coughing. Sarin is an inhalation hazard that we classify as a nerve agent. Nerve agents inhibit the nerve transmission and muscle coordination within the body, and nerve agents are extremely toxic.

An alternate route of entry for toxic effects involves skin exposure material to chemical hazards. The skin exposure hazard is also indicated on the aforementioned chart. Two of them in particular are unique in that they have different effects on the skin. One chemical is mustard. It is a liquid at room temperatures and causes painful burns and blisters on its victims. Both mustard liquid and vapor can penetrate ordinary clothing, and because it vaporizes slowly, it is termed a persistent agent and can be extremely useful in denying terrain to an enemy on the battlefield.

Another skin exposure material is the nerve agent VX. V-agents are also persistent and extremely toxic. VX can penetrate through the skin and produce its toxic effects.

The last route of entry is by ingestion. Chemical hazards of this type are usually labeled poisons. The ingestion chart before you describes the characteristics of the common poison cyanide.

Cyanide, an analog of hydrogen cyanide, is readily available commercially and rapidly attacks the respiratory system. The Jonestown tragedy in Guyana in 1978 was a stark example of how effective cyanide poisoning can be.

To fully appreciate our vulnerability to chemical hazards, it is important to understand how easily these hazards can be acquired. Most industrial hazards like chlorine or phosgene are readily available on the open market. Military-unique materials, such as nerve or blister agents, would probably have to be synthesized. Synthesis of these particular agents like sarin requires some degree of technical sophistication and a source for the appropriate precursor materials.

Assessing vulnerability also requires consideration of a compound's volatility. For example, hydrogen cyanide is very volatile so its use outdoors is limited. Dispersion of this agent in closed areas would, however, present a significant problem. Most hazardous industrial chemicals and military-unique chemicals can be effectively disseminated using explosive ordnance or commercial sprayers. A commercial sprayer can be as simple as this spray can of household disinfectant that I am demonstrating here. Even simple pouring of a chemical onto a surface can be effective depending on where you pour it and what kind of chemical you are deploying. Typically, volatile chemicals with moderate toxicity in closed spaces will cause the most concern. If the population density is high in the area around the chemical incident, then obviously the resultant casualties will probably be higher.

Based on my experience—and this is my own personal experience and not necessarily the views of the administration or the Department of Defense—I firmly believe that we have the technical expertise, training, and protection to meet virtually every chemical threat in a battlefield environment. I do, however, have some concerns if these horrific weapons were used in a civilian setting. In wartime, key targets are usually the combatants themselves who have protection and contingency systems, and they are trained to work in that hazardous environment. Our military extensively trains our forces to respond and, therefore, they are prepared.

On the other hand, responding to the use of chemical agents in a civilian setting presents significant challenges to our country. Terrorists follow no rules of engagement. Incidents involving chemical agents sponsored by a terrorist group almost always target non-combatants. These non-combatants will not be trained or equipped. These are our basic civilians, the basic citizens out on the street. Chemical terrorism particularly in the civilian setting will evoke a strong psychological response from targeted individuals.

Another dimension regarding the possible use of these weapons is that chemical terrorism can be used to achieve effects other than anti-personnel. For example, the Chilean grape incident involving cyanide-tainted grapes damaged the Chilean economy.

I would like to conclude by commenting where we are and where we need to go. Again, these are my own personal views, but I think that these are well-founded based on my experience, my professional involvement with many of the agencies over the years.

I believe that the Department of Defense has the unique capabilities and resources to effectively support and assist the lead government agencies in their response to chemical terrorism and a chemical incident. I think, however, that we need to improve and refine our technical response in this critical area. My suggestions are as follows:

First, we could initiate a national training program to facilitate the effectiveness of first responders and reduce casualties to the public.

Second, we could establish an exercise program that would test and refine all mission critical areas so that an integrated response force is realized throughout the United States.

Finally, we could promote a new generation of research and development that specifically draws on existing military and commercial programs to handle this problem. That focus should be on customizing and improving response tools and techniques in this new mission area, thereby minimizing risk to the public and to the environment. Some key technical areas for development include hazard mitigation techniques, first responder protection, improved detection and monitoring, and scenario-dependent hazard prediction and modeling.

I hope my comments have been helpful, and I thank the panel for this opportunity to provide my insight into this crucial area.

[The prepared statement of Mr. Genovese follows:]

PREPARED STATEMENT OF MR. GENOVESE

Good Morning, Mr. Chairman and Members of the Subcommittee. I am James A. Genovese from the U.S. Army Chemical and Biological Defense Command. It is a pleasure to be with you today to discuss the nature of the threat presented by the use of chemical weapons.

I presently serve as the Team Leader for the Chemical/Biological Counterterrorism Team at the Edgewood Research Development and Engineering Center. My responsibilities focus on development of technological countermeasures to respond to a chemical or biological incident. In addition, I serve as a Cochairman of the Weapons of Mass Destruction Countermeasures Subgroup of the Technical Support Working Group. This working group was established in 1987 to specifically address research and development necessary to counter terrorism and consists of representatives of over 40 governmental agencies. I also serve as the chairman of an international research and development working group on chemical/biological terrorism also sponsored by the Technical Support Working Group.

I have over 20 years experience in the field of chemistry and have served the U.S. Army as a research chemist for approximately 14 years. The first 9 years of my service were devoted to developing chemical munitions for the Army's Retaliatory Chemical Munitions Program.

Chemical weapons have been used in warfare for over 2,500 years. Six hundred years before the birth of Christ, Athenian troops won a battle by poisoning their enemy's drinking water. During the American Civil War, several ideas for the use of chemical weapons were considered including using projectiles to deliver hydrochloric acid and chlorine.[1, 2]

The idea of using chemicals as a warfare multiplier surfaced again some 50 years later during the First World War. Germany led the world in chemistry at that time and turned to chemists to provide a weapon. The weapon they chose was chlorine gas which, like phosgene, is classified as a choking agent. These agents attack the lungs to cause severe choking and coughing, and can be lethal.

On a glorious spring day near Ypres, Belgium, on April 22, 1915, a hissing sound could be heard coming from the German trenches in a sector where British and French forces joined. The hissing sound came from 6,000 chlorine gas cylinders spewing their lethal contents upwind of the Allied Forces.

> An excerpt from McWilliams and Steel's book *"Gas—The Battle for Ypres, 1915"* describes the horrors of the choking agent used at Ypres: Shrieks of fear and uncontrolled coughing filled the poisonous air. Terrified soldiers clutched their throats, their eyes staring out in terror and pain. Many collapsed in the bottom of their trenches and others clambered out and staggered to the rear in attempts to escape the deadly cloud. Those left in the trenches writhed with agony unspeakable, their faces plum-colored, while they coughed blood from their tortured lungs.[3]

The Allied soldiers at Ypres were totally unprepared for that chlorine gas attack. Over 15,000 casualties were reported in the press.[4]

Memories of World War I, when chlorine, phosgene, and mustard were used to kill thousands, are once again resurfacing in the minds of many. As the war between Iraq and Iran so painfully revealed, chemical warfare agents are rapidly becoming a major military force in some countries. These agents can relatively inexpensively provide a substantial psychological edge to countries lacking a viable conventional military convential threat.[5,6]

Over twenty countries are believed to possess chemical weapons or to have the ability to manufacture them. In the War between Iran and Iraq from 1980 to 1988, United Nations reports documented the use of chemical weapons by both sides. Over 45,000 chemical casualties were reported.[7]

Chemical warfare agents are chemicals that have a toxic effect on humans, animals or plants—with humans obviously being the major target. There are three methods for producing chemical casualties within human beings: Through inhalation; through skin effects which include both absorption, through the skin, and dermal wounds; and through ingestion of hazards through the digestive tract. These methods are called routes of entry.

Toxic effects through inhalation are caused when a person or animal inhales the chemical hazard. Inhalation hazards are usually generated as gases or aerosols. Gases often are invisible. Aerosols are comprised of small particles. These particles can be either solids or liquids.

Some examples of chemical inhalation hazards are hydrogen cyanide, chlorine, and Sarin. Hydrogen cyanide is a blood agent which directly inhibits respiration by interfering with a key enzyme in the body called cytochrome oxidase. This enzyme is responsible for the energy-producing mechanisms of the body. Chlorine is a choking agent which attacks the lungs and causes severe coughing and choking. Sarin is an inhalation hazard that is a nerve agent. Nerve agents inhibit the enzyme cholinesterase which facilitates nerve transmission and muscle coordination. Nerve agents are extremely toxic.

Toxic effects from chemical agents are based on the amount of that hazard that is accumulated in or on the body. For inhalation hazards, it is the amount of that hazard we breathe into our lungs.

To give the Committee an appreciation of the relative toxicity of some of these chemicals, a container with 48 ounces of chlorine, a choking agent; another container with 25 ounces of hydrogen cyanide, a blood agent; and a vial with about one-third of an ounce of the nerve agent Sarin can all produce up to 5,000 lethal casualties if disseminated effectively with maximum effectiveness. The chemical Sarin was the chemical that Supreme Truth Cult disseminated in the Tokyo Subway system.

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[1] Victor A. Utgoff, *The Challenge of Chemical Weapons*, pgs 1–3.

[2] BG Alden H. Waitt, *Gas Warfare*, pgs 8–9.

[3] James L. MacWilliams and R. James Steel, *Gas—The Battle for Ypres*, 1915, pgs 45–49.

[4] Utgoff, op. cit., pg 5.

[5] Utgoff, op. cit., pg 6.

[6] Albert and Leininger, *Biochemistry*, pgs 494–495.

[7] Satu M. Somani, *Chemical Warfare Agents*, pgs xv, xvi and 1–4.

The following chart lists the characteristics of some of the more prevalent inhalation hazards:

INHALATION HAZARDS

Hazard type	Chemical	Effect	Form	Toxicity	Outcome
Choking agent	Chlorine	Choking/ coughing	Gas	Low to medium	Incapacitation death
Blood agent	Hydrogen Cyanide	Affects respirtion	Gas	Low to medium	Incapacitation death
Nerve agent	Sarin	Lose muscle control	Liquid	High	Death

An alternate route of entry for toxic effects involves skin exposure to chemical hazards. The following Skin Exposure Hazard Chart describes the characteristic's of two common skin hazard chemicals:

SKIN EXPOSURE HAZARDS

Hazard type	Chemical	Effect	Form	Toxicity	Outcome
Blister agent	Mustard	Burning/ blistering	Liquid/ vapor	Medium	Pain
Nerve agent	VX	Lose muscle control	Liquid	High	Death

One skin hazard chemical is mustard. It is a liquid at room temperatures and causes painful burns and blisters on its victims. It can, depending on the environmental conditions, present a significant vapor hazard. Both liquid and vapor can penetrate ordinary clothing. Because it vaporizes slowly, it is termed a persistent agent and can be extremely useful in denying terrain to an enemy on the battlefield. On July 12, 1917, the Germans again surprised the Allies by introducing mustard delivered by artillery shells to the battlefield.

Another skin exposure hazard is the chemical VX. V-agents are persistent with very low vaporizing potential. Because VX is an oily, non-volatile liquid it can remain in place for weeks or longer posing a continuing threat to those in the area. VX is an extremely toxic nerve agent that can penetrate through the skin to produce its toxic effects.

The last route of entry for chemical agents is by ingestion. Chemical hazards of this type are usually labeled poisons. Most poisons usually are ingested by drinking or eating substances that have been contaminated with the poison. The following chart describes the characteristics of the common poison cyanide, an ingestion hazard:

SKIN EXPOSURE HAZARDS

Hazard type	Chemical	Effect	Form	Toxicity	Outcome
Blood agent	Cyanide	Affects respiration	Solid	Low to medium	Death

Cyanide is readily available commercially as sodium or potassium salts. This potent analog to hydrogen cyanide works by the same principle: Rapidly attacking the respiratory system. The Jonestown tragedy in Guyana in 1978 was a stark example of how effective cyanide poisoning can be.

To fully appreciate our vulnerability to chemical hazards, it is important to understand how easily these hazards can be acquired. Many industrial hazards like chlorine or phosgene are readily available on the open market. Equipment to make chemical agents and specific knowledge necessary for production can also be easily obtained. On the other hand, military unique chemical agents such as the nerve or blister agents, would probably have to be synthesized and therefore require a higher degree of technical sophistication. Synthesis of nerve agents like Sarin also require a degree of technical expertise and a source for obtaining the needed precursor materials and corrosion-resistant equipment.

Assessing vulnerability also requires consideration of the volatility of the agent. For example, hydrogen cyanide is very volatile so its use outdoors is limited. Dispersion of this agent in closed areas would, however, present a significant threat. Persistent agents such as mustard or VX are not as volatile. They can be sprayed or poured onto large areas which will result in a contaminated area that will persist for a long time.

The method and location of dispersion of the chemical hazard is important as well. Most hazardous industrial chemicals and military-unique chemicals can be effectively disseminated using explosive ordnance or commercial sprayers. Even simply pouring a chemical agent onto a surface can be effective under certain circumstances. Typically, volatile chemicals with moderate toxicity in closed spaces will cause the most concern. If the population density is high in the area around the chemical incident, the resultant casualties will probably be higher.

Based on my experience, I believe that the United States has the technical expertise, training, and equipment to meet virtually every chemical threat in a battlefield environment. I do, however, have some concerns if these horrific weapons were used in a civilian setting. In wartime, key targets are usually the combatants who have protection and contingency systems to allow them to function in a hazardous environment. Our military extensively trains our forces how to respond to and function in a hazardous environment.

Responding to the use of chemical agents in a civilian setting presents significant challenges to our country. Terrorists follow no rules of engagement. Incidents involving chemical agents sponsored by a terrorist groups almost always target civilian noncombatants. These non-combatants will not be trained or equipped. Chemical terrorism particularly in the civilian setting will evoke a strong psychological response from targeted individuals.

It is incumbent upon our government to appreciate the nature of the threat presented by chemical weapons and plan a good, effective response. We should insist that first responders are adequately informed, protected, and trained to handle chemical incidents against non-combatants.

Another consideration is that terrorists could possibly use chemical agents to achieve effects other than anti-personnel. For example, the Chilean grape incident involving cyanide-tainted grapes damaged the Chilean economy.

I would like to conclude by commenting where we are and where we need to go. I believe that the Department of Defense has the capabilities and resources to effectively support the lead government agencies in their response to a chemical incident. I think, however, that we need to improve and refine our response in this critical area and offer three specific suggestions.

First, we could initiate a national training program to facilitate the effectiveness of first responders and reduce casualties to the public. The program would be designed to educate all levels of government in responding to a chemical or biological incident.

Second, we could establish an exercise program that would test and refine all mission critical areas. These exercises would also help to ensure that response teams throughout the United States are effective and properly integrated.

Finally, we could promote a new generation of research and development that draws from existing military and commercial programs. The focus should be on customizing and improving response tools and techniques in this new mission area thereby minimizing risk to the public health and the environment. Some key technical areas for development include hazard mitigation techniques, first responder protection, improved detection and monitoring, and scenario-dependent hazard prediction and modeling.

I hope my comments have been helpful and thank the Committee for this opportunity to provide my insight into this crucial area.

BIBLIOGRAPHY

Compton, James A. F. *Military Chemical and Biological Agents.* Caldwell, NJ: The Telford Press.

Chemical/Biological Incident Handbook. Interagency Intelligence Committee on Terrorism, Central Intelligence Agency, 1995.

Field Manual 3–5: NBC Decontamination. Washington D.C.: Department of the Army, 1993.

Field Manual 3–7: NBC Field Handbook. Washington, D.C.: Department of the Army, 1994.

Field Manual 3–9: Potential Military Chemical/Biological Agents and Compounds. Washington, D.C.: Department of the Army, 1990.

Field Manual 8–285: Treatment of Chemical Agent Casualties and Conventional Military Chemical Injuries. Washington, D.C.: Department of the Army, 1990.

Geissler, Erhard (Ed). *Biological and Toxin Weapons Today*. London: Oxford University Press, 1986. Prepared for Stockholm International Peace Research Institute.

Killinger, Mark H., et al. (Eds) *Chemical/Biological Incident Handbook*. Seattle: Pacific Northwest Laboratory, 1993. Prepared for U.S. Department of Energy.

Lehninger, Albert L. *Biochemistry*. New York: Worth Publishers Corporation, 1975.

NacNaughton, Dr. Michael G. and Brewer, Joseph H. *Environmental Chemistry and Fate of Chemical Warfare Agents*. San Antonio: Southwest Research Institute, 1994.

McGeorge, Harvey J. II. *Chemical/Biological Terrorism Threat Handbook*. Woodbridge: Public Safety Group, 1989. Prepared for Chemical Research Development and Engineering Center, Aberdeen Proving Ground.

McWilliams, James L. and Steel, R. James. *Gas! The Battle for Ypres, 1915*. St. Catharines, Ontario: Vanwell Publishing Limited, 1985.

Somani, Satu M. (Ed). *Chemical Warfare Agents*. New York: Academic Press, Inc., 1992.

Spiers, Edward. *Chemical Warfare*. Urbana and Chicago: University of Illinois Press, 1986.

Utgoff, Victor A. *The Challenge of Chemical Weapons. An American Perspective*. New York: St. Martin's Press, 1991.

Wachtel, Carl. *Chemical Warfare*. Brooklyn: Chemical Publishing Company, Inc., 1941.

Waitt, Alden H., Brigadier General. *Gas Warfare: The Chemical Weapon, Its Use, and Protection Against It*. New York: Duell, Sloan and Pearce, 1944.

Senator NUNN. Thank you very much, Mr. Genovese, Mr. Olson, and Dr. Eitzen.

I have lots of questions for all of you, but I am going to cut mine short today and rotate it around because we do have one other witnesses, and all of your testimony has been very, very helpful today.

First, Mr. Olson, I understand that you met with the head of the cult's Science and Technology Ministry—I believe the pronunciation is Murai.

Mr. OLSON. Murai.

Senator NUNN. Murai—before he was assassinated and the news spokesperson for the cult, Mr. Joyu, before his arrest. What can you tell us about Mr. Murai and Mr. Joyu?

Mr. OLSON. I had the opportunity to speak with both gentlemen over the course of an hour or two in Tokyo. This was probably 3 weeks or so after the subway attack.

Senator NUNN. Talk right into that mike.

Mr. OLSON. Thank you. Hideo Murai struck me as being a rather true believer. He seemed to have a certain, if you will, Buddhist calm about him. At the same time, it seemed very clear to me that there were a great many things going on behind that rather calm exterior.

Senator NUNN. He was the head of the so-called Science and Technology Ministry.

Mr. OLSON. Exactly. According to the authorities, he was the man who was essentially in charge of the development of almost all their weapons and was really very close to Asahara in terms of the hierarchy.

In essence, I guess I would characterize Murai as probably a fanatic. He was very comfortable with who he was, very comfortable with what he was doing. In fact, the only time that I really was able to get anything from him in terms of a break in his composure was at one point when he was discussing the chemical plant at Satyam 7 at Kamakuishiki, in which he acknowledged that they had purchased a material for some of the piping and vessels in there, a material known as hastalloy. Hastalloy is an extremely corrosion-resistant material. Among other things, it is one of the materials that if you were going to milspec out a chemical weapons plant, you would specifically look for. Hastalloy, in fact, is on our controlled list of exports specifically because of its applications to chemical weapons production. So that was an interesting event. He was assassinated approximately a week after I spoke with him.

Joyu, by comparison, and as has been noted before, enjoyed a tremendous amount of celebrity because he was the face man for the cult following the Tokyo attack. In fact, he became a teenage heart throb because of his regular appearances. He really seemed to enjoy the limelight. He also seemed, I think, to be very pragmatic. He seemed to feel that he was in control of the situation even when it was slipping away from him.

He was one of the members of the cult who was most actively trying to get the cult to disband itself as a church in a rather, I think, cynical effort to try to hold onto its financial and commercial assets.

Senator NUNN. And he was arrested?

Mr. OLSON. He was arrested about 2 weeks ago, I believe.

Senator NUNN. What was the charge against him?

Mr. OLSON. He is, I think, involved in withholding information regarding a kidnapping, if I remember correctly. He has not been charged specifically with any of the nerve gas events themselves.

Senator NUNN. Mr. Genovese, what can you tell us about the technological expertise of the Aum? I believe you reviewed parts of the staff statement dealing with the purchases the Aum made in the United States. Can you tell us about the significance of the laser, the aluminum oxide, the filters, the batteries, and the small fans?

Mr. GENOVESE. Yes, sir. What I would like to do is address them individually and then to summarize how I see those particular technologies fitting as a package for developing chemical ordnance.

Senator NUNN. Good.

Mr. GENOVESE. First off, the Hobart laser, I am not totally familiar with this technology, but I assume it to be a high-energy laser. These kinds of high-energy lasers can be used as a special sealing mechanism, especially if you are dealing with almost ceramic materials that the Aum was working with. They have a particular material called aluminum oxide which has ceramic properties. That thing is very difficult to weld with conventional techniques.

However, their choice for aluminum oxide suggests that they thought that whatever was going to go in those particular containers would have to withstand the corrosive capabilities of some of the nerve agents. So they chose those particular materials.

So those two pieces of information suggest, as well as there was also some allusion earlier by your staff on HEPA filters. The HEPA filters, the acronym means high-efficiency particulate absorber. These filters are conventional filters that are used in all military respirators, which suggests that this operation that they were anticipating would involve possibly either a chemical or a biological process.

So with those three pieces of information, it suggests to me that, in fact, the Aum was seriously looking at processing hazardous materials, specifically chemicals from what I can see here at first glance.

There were some other materials that they also acquired. Those were alluded to also by your staff statement, which included camcorder batteries and small fans and vials. Those to me—and I have worked in the chemical weapons area for a number of years. Those to me suggest that they were trying to configure some small devices to effectively disseminate chemical agent liquids and that they would use the fans to blow out the volatile liquids, the batteries to drive the fan's operation, and the vials to store the agent until it was disseminated.

Senator NUNN. Why didn't more people die in the subway attack, Mr. Genovese?

Mr. GENOVESE. These are my own opinions on this. Some of these I think are common sense, and others ones are just my own technical perspective as to how I saw that situation. Again, I am speaking only from the knowledge that I gained from journal articles and newspapers.

But I think, first, the purity of the synthetic materials that were used—there was some comment that there may have been a binary process and that maybe in the fact of making that binary process work that they didn't do a very good job of that. Also, maybe the starting materials of that binary process were not all that pure. So that will certainly affect the toxicity of those materials.

The second thing is—and I think this is very important—their method of dispersion. I would call a leaky lunch box probably one of the poorest dispersion mechanisms that you could have, considering even the volatility of sarin, which has about the same vaporizing potential as water. So this pouring of the liquid onto the floors of the Tokyo subway was not the best way to disseminate sarin.

I think in your staff's statement in the Matsumoto incident, it was alluded to that a truck with a heating system and a spraying system was used in Matsumoto. That seems like a more realistic and viable system if you are going to look for high casualties.

I think the third reason why the casualties were lower is that there was good ventilation in the Tokyo subway system, and I think that tends to remove and dilute the hazard so that you don't get the chemical concentration that would normally—that you would see for high casualties.

Finally, another one, which is just my own personal feeling, is most of the lunch boxes were actually dispersed and disseminated inside the subway cars. And the cars themselves have a tendency, because they are a kind of physical barrier, will tend to at least preclude some of the vaporization that could occur throughout all the subway tunnels.

Senator NUNN. Dr. Eitzen, isn't it true that a lot of the biological agents cause illnesses that are similar to illnesses that are having to be dealt with in the normal society? And if that is the case, how quickly could we really detect that certain rapidly spreading illnesses were really because of an attack?

Dr. EITZEN. Senator, that is very true. Many of the early symptoms of the diseases caused by biological warfare agents would be similar to symptoms that physicians might see with a disease that they see every day, such as the flu or other types of illness.

However, I think that really the scale in terms of numbers becoming ill and also the time course of events would lead physicians in a local area of an attack, if they had the right epidemiologic perspective, to say that there is something unusual going on here. Sheer numbers as well as attack rates of illness as well as numbers of people presenting to emergency departments for care should make the local public health officials pick up on the fact that there is an unusual event that has occurred.

Also, with a number of these BW-caused illnesses, there are certain clinical indicators that would indicate that there is something unusual, for instance, a widened mediastinum on chest X-ray with anthrax. So for those reasons, I think there would certainly be some indicators that this is an unusual event.

Senator NUNN. Thank you.

Mr. Olson, the Japanese police, I am told, have not yet completed the search of the biological facility, or at least one of the biological facilities is closed up, I understand, and the search has not yet been completed, I am sure because of possible dangers and hazards. But you have some details about that facility, I believe. Could you share those with us?

Mr. OLSON. Well, my information actually refers to an earlier facility, a facility that they had established back in 1990. I debriefed a member of the cult who had left the cult, left Aum Shinrikyo, and who had made himself available to talk, who described in some detail a large facility—again, this is circa 1990—in which they had four or five large fermentation tanks; they had the appropriate equipment such as nitrogen feeds and other materials to support the growth within those fermentation tanks of what he concluded was clostridium botulinum.

He described a process by which the organisms were cultivated, were harvested, then taken through into a laboratory where they were first freeze-dried, then heat-dried into a cake. The cake itself was then pulverized. The resulting pulverized particles were then put into an aerosol. They then sprayed those on guinea pigs. This was apparently at the specific direction of Asahara himself who had recruited this gentleman from the cult's ranks.

Senator NUNN. Sprayed those on what? I didn't hear you.

Mr. OLSON. Sprayed them on guinea pigs. They actually maintained a stock of guinea pigs for experimental purposes.

Now, even back in 1990 they were not successful, apparently, in mastering the tricks required to take the toxin which they were extracting and turn it into an effective weapon. But the description was rather extreme.

That facility itself was apparently dismantled about 2 years ago, though on my first visit—excuse me, my second visit to Tokyo, the first one right after the subway attack, I did see photographs taken by a British film crew of one of the warehouses at the compounds there at Kamakuishiki, and sitting in the middle of an otherwise empty warehouse were the concentration tanks which had been used to collect the material from the fermenters.

At the time I wasn't sure what they were. I have since satisfied myself that, in fact, those were pieces of the original BW facility.

Senator NUNN. Mr. Genovese, based on what you have heard this morning from the staff statement and Mr. Olson and so forth, do you believe that the Aum was going to be able to be successful in producing biological weapons at some point? Was that inevitable? Did they have enough infrastructure? Did they have enough materials? Did they have enough expertise? Or do you believe that they were doomed to failure?

Mr. GENOVESE. Sir, I think that their attempts—and I am couching that with the fact that they had the money to buy the high technology equipment. I think with that in mind, the intent was there for them to seriously look at both acquiring or synthesizing both chemical and biological materials. The materials and the equipment that I relayed to you earlier certainly suggest that they have a much higher level of sophistication than I would have ever expected out in the world. And that impressed me, but at the same time it concerns me that although they may not have all of the pieces together, they were certainly moving in the right direction and had the basic capability to start making things happen. And that certainly did concern me.

Senator NUNN. Dr. Eitzen, do you have an opinion on that? Given time, were they going to be, in your opinion, based on what you have heard, were they likely to be successful in producing a real biological weapon that would do serious damage?

Dr. EITZEN. Senator, based on what I have heard this morning about the cult—and this is a personal opinion—I believe that they eventually could be successful in growing biological agents. We know that they had some culture media in their compound in Japan that would allow them to grow many bacterial agents, including bacillus anthracis, or anthrax, and clostridium botulinum, which is the organism which elaborates botulinum toxins.

I think that with the right amount of effort and with the scientific expertise, the level of sophistication that they demonstrated in terms of their overall capability, I think that that is certainly possible.

Senator NUNN. In your assessment, a group like that that did succeed, if they had succeeded in producing biological weapons, which would have been more dangerous: The biological weapons or the chemical weapons?

Dr. EITZEN. Senator, I think that if you look at the overall casualty numbers that could be produced by chemicals versus biological weapons, and if you particularly take the worst-case weapons in terms of the biologicals—and I don't want to be too specific because I don't want to give anybody ideas. But I think that certainly biologicals have a greater casualty-causing potential an order of magnitude higher than chemical weapons could produce.

Senator NUNN. Mr. Olson, do you agree with that based on what you know?

Mr. OLSON. Yes, Senator. I don't think there is any question that their pursuit of biological weapons was a very eyes-open pursuit. They knew they were looking at developing a weapon that would have easily given them the ability to trump the Japanese military or police, and perhaps a lot of other people as well.

Senator COHEN. Dr. Eitzen, I think that Senator Nunn perhaps asked you a leading question. He said, Based upon what you have heard today, what was your assessment? I assume you have heard much more than what you have heard today, that you have been briefed for some time now, and so you are not just now forming a conclusion as to what you know as of this moment from this hearing. Is that correct?

Dr. EITZEN. Right. Yes, Senator, that is correct.

Senator COHEN. So it is based upon what you, as one who has been in charge of dealing with the bio-defensive systems, have formed as an opinion much earlier than today.

Dr. EITZEN. Yes, Senator. What I meant was that I just wanted to allude to the fact that this is a personal opinion of mine, not a position of the Department of Defense.

Senator COHEN. Let me make an observation with respect to chemicals in particular, and perhaps biological weapons. Much of the technology for these weapons systems is based upon having access to Western technology. I mentioned Rabat earlier today, and we know that at least two of our closest allies were directly involved in the helping to construct that facility and for some of the containers that would contain the chemicals produced by that facility. So when you are talking about either deutsche marks or yen or dollars involved, you have got a big problem with Western societies supplying the technology for these nations who are dedicated to developing either a chemical weapons or biological weapons capability.

We are the ones who are providing the technology. In some cases, it may be dual-use technology, so you have a problem. In some cases, it may be that some countries legitimately are trying to promote their agriculture, and therefore they are developing agricultural insecticides. The same facility that can make an agricultural insecticide or pharmaceutical can make chemical weapon agents.

So there are some problems related to the dual-use nature of some of our technology. But the fact is we have to raise high the roof beams and warn all of our allies and potential enemies of what the specter of a chemical weapons or biological weapons attack means and what it means for the rest of humanity to let this particular genie out of its bottle.

I am going to talk in a moment about Russia. They signed on, as I recall, to the Biological Weapons Convention back in 1970, was it not, Dr. Eitzen?

Dr. EITZEN. Actually, the convention was 1972, and I believe they signed on shortly thereafter.

Senator COHEN. Shortly thereafter. The problem is it has no verification regime. Is there any doubt in any of your minds that Moscow is, in fact, complying with that particular treaty?

As a matter of fact, just last month in London, there was a group of scientists gathered at the International Workshop on Anthrax, and according to one participant, the Russian researchers surprised the conference by publicly revealed they had genetically modified anthrax specimens to give them resistance to various common antibiotics. It wasn't surprising to me that they are engaged in genetic modification, but what was surprising was that they would publicly admit this.

This poses, I would assume, a major problem for everyone. If, in fact, we have developed some common antibiotics that would protect against anthrax, would this not give the Russian military an advantage in their bio-warfare program? Dr. Eitzen, Mr. Olson, Mr. Genovese, any one of you? Isn't this a serious problem when you are talking about the genetic modification of anthrax?

Dr. EITZEN. Potentially serious problem, Senator. It depends on which antibiotics they are able to induce resistance to and which antibiotics we choose to arm our soldiers with, if you are talking about a military scenario.

Senator COHEN. Mr. Olson?

Mr. OLSON. Senator, I think we have to differentiate between the technologies that are available for major powers, such as the former Soviet Union, today the Russian Federation, and certain other nations around the world and what they can go about doing. And those are in many cases what we are talking about, gene splicing or biotechnology, we are talking about high-end technologies.

On the other hand, there are many reasons to be afraid of bugs that can be produced using much cruder levels of technology, using technologies as we have seen in Iraq, for example. One of their methods of appropriating technology for their biological weapons program was simply to go to existing medical facilities and vaccine research facilities and strip the equipment out and take it off to their military laboratories.

The problem of trying to set a barrier against the proliferation of these technologies is such that you simply can't lock the door and assume that the problem is solved. It is one that requires continual vigilance.

As you note, the biological and toxins weapons convention has no verification provisions. One of the positive steps that is occurring right now is that there is a multilateral effort to try to negotiate an addendum that will create some sort of a mechanism. It is not perfect——

Senator COHEN. Assuming you have the convention and it is ratified, isn't verification still going to be very difficult?

Mr. OLSON. All it gives you is a mechanism to begin trying to do if not the impossible, the extraordinarily difficult, yes. But in the absence of a verification regime, we have no mechanism even to attempt such a trick.

Senator COHEN. Are we taking advantage of genetic engineering for defensive purposes, Dr. Eitzen?

Dr. EITZEN. Yes, sir. We use those techniques in our laboratories in the development of new vaccines and, in fact, are working on a number of new vaccines that involve use of recombinant technology techniques to develop those. So, yes, sir, that technology certainly has both potential good as well as potential bad uses.

Senator COHEN. So on the one hand, the technology you can develop to defend can also be used in an offensive manner?

Dr. EITZEN. Yes, sir. That is just one example of how many aspects of these technologies have potential dual uses.

Senator COHEN. Are you aware of a company called the Human Genome Sciences?

Dr. EITZEN. No, Senator.

Senator COHEN. Anyone here?

[No response]

Senator COHEN. Well, I will hold that for later, then. It is a company that apparently has made a presentation about a system that can rapidly sequence genes and use that information to design vaccines to viruses and bacteria. I hope at some point you will get the same briefing as some of our staff members have had.

Mr. Chairman, I know we have another panel, at least one more witness to testify. I have other questions that perhaps I could submit for the record for these fine witnesses. But I think what we have done with these hearings is raise the issue to a high enough level that we do get the sort of international cooperation that is going to be absolutely essential for every country to realize that it is not in their economic interest to be transferring technology which can contribute to the problem, understanding that you don't need necessarily to have high levels of technology. By the same token, we ought to do everything in our power to resist that proliferation. And it is not only a cult which happens to accumulate anywhere from $400 million to $1 billion, or whatever the figure might be. You also have nations who can have the capital to acquire these technologies and the various types of either chemical or biological agents from existing stockpiles of nations that may be under economic pressure to sell them. So it is not only the cult groups you have to be concerned about. It is about other nation's states who also sponsor terrorism.

Thank you, Mr. Chairman.

Senator NUNN. I want to thank all of you for being here. We will have another day of hearings tomorrow, but we are going to continue on this subject. Senator Lugar is going to be involved in this and Senator Cohen and I for some time to come, because I think there are a number of us—hopefully a growing number—that believe this is our top national security threat for the years to come. So we appreciate all of you being here.

Mr. OLSON. Thank you.

Dr. EITZEN. Thank you, Senator.

Mr. GENOVESE. Thank you.

Senator NUNN. Our next witness is Yumiko Hiraoka who has indicated she is a nun, in her words, with the Aum Shinrikyo organization and a sect leader in their New York office. She is here with her attorney, Jeremiah Gutman of New York. She has declined the Subcommittee's invitation to read or submit a prepared statement.

For the record, I would note that the witness, through her attorney, has requested that her face be disguised or otherwise obstructed from publication. I had some misgivings about this request, studied it carefully. Certainly she is a member, an acknowledged member of the Aum organization and, indeed, an officer of the cult. However, the letter I received from the attorney and the conversations the attorney has had with staff—and I will just read a couple of paragraphs from the letter, and then I will put the letter in the record. Quoting from Mr. Gutman, "Given the nature of the charges against Aum Shinrikyo and the fact that several of the people involved have already pleaded guilty, and given the alarming nature of the allegations of homicide and violence made against some of the people involved, Ms. Hiraoka and I are extremely concerned for her safety. It is likely that members of Aum Shinrikyo will regard Ms. Hiraoka not only as an apostate, but also as a traitor, and seek to wreak vengeance upon her." And he goes on, and I will put the letter in the record.

In an abundance of precaution, I am going to acknowledge and oblige the attorney's request by having her testify behind an opaque screen. This letter will be part of the record. She will be brought in the room in a few minutes.[1]

Senator NUNN. I would advise all the media in attendance here today that they should not attempt to capture the witness' image in violation of the Subcommittee ruling. At this time I would ask all media and persons in attendance with cameras or video equipment to turn them off, turn them to the back of the room, point the cameras down as she comes in the room. I will also, say, give them time to have a seat at the table, and then I will notify all the cameras to—that they can turn their cameras back on at that stage. But she will be protected by the screen.

Now, if I don't have cooperation, I will have to empty the room. That will take another 15 to 20 to 30 minutes. I would prefer not to do that, but if I don't have complete cooperation, we will do that.

Although Ms. Hiraoka, though a native Japanese speaker, does speak and understand some English, apparently with limitations, the Subcommittee because of these limitations has agreed to provide her with a translator as needed to assist her in taking the testimony.

So I would ask all the cameras to be turned off at this point and be turned to the back of the room. If you could not only turn them off but turn them to the back of the room, I don't want any of them pointing up here. And that would go for still photographs as well.

At this point I would ask that the witness be brought in. All the cameras off? OK. Thank you for your cooperation. The witness will be brought in.

We have Ms. Yuchita, who is the translator, on the far left; our witness is in the middle; and then her attorney is on this side. Mr. Gutman, as you know, we swear in all the witnesses before our Subcommittee. Rather than having your client stand, I will ask her to hold up her hand where she is seated, and I would ask the translator to explain to her that what I am doing is administering the oath. I will go slowly so that you can give her that.

Would you hold up your right hand, please? Do you swear the testimony you will give before this Subcommittee will be the truth, the whole truth, and nothing but the truth, so help you God?

Ms. HIRAOKA. Yes.

Senator NUNN. Thank you.

Mr. Gutman, we swear in all the witnesses before the Subcommittee, as you know. We also would give your client a chance to consult with you on any question that you or she may indicate that you need time on.

So if we ask a question where you or your client feels that you need to consult, you would be able to do that, and I would give the interpreter a chance to explain that also to the witness.

Mr. GUTMAN. Thank you, Senator.

Senator NUNN. Also, I would ask both the witness and the interpreter to speak into the microphone. Do we have the microphone up close enough now? If you could lean forward and speak directly into the microphone, maybe turn it up, and also the interpreter.

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[1] The letter appears as Exhibit No. 40.

I will ask the witness to please state your name and your present occupation.

TESTIMONY OF YUMIKO HIRAOKA, AUM SHINRIKYO NUN AND SECT LEADER, NEW YORK CITY CHAPTER, ACCOMPANIED BY JEREMIAH GUTMAN, ESQ.

Ms. HIRAOKA. [Interpreted from Japanese.] My name is Yumiko Hiraoka. My present occupation is a manager of the New York branch of Aum Supreme Truth.

Senator NUNN. Could you give us your age?

Ms. HIRAOKA. Over 30. [Laughter.]

Senator NUNN. Over 30. Could I ask you if you are under 40?

Mr. GUTMAN. You could ask, Senator.

Senator NUNN. What is your age?

Senator COHEN. Approximately.

Senator NUNN. We will give you a leeway of a year or two. Just tell us close.

Ms. HIRAOKA. Over 35.

Senator NUNN. Over 35. OK. Do you have any names other than the name you have given us this morning? Do you have any other names by which you are known?

Ms. HIRAOKA. My holy name is Suba.

Senator NUNN. Is that your religious name?

Ms. HIRAOKA. Yes.

Senator NUNN. So you have a religious name that is Suba?

Ms. HIRAOKA. Yes.

Senator NUNN. How long have you had that name?

Ms. HIRAOKA. About 5 or 6 years.

Senator NUNN. About 5 or 6 years. Thank you.

How long have you been a disciple of the Aum Shinrikyo?

Ms. HIRAOKA. About 8 years.

Senator NUNN. About 8 years. That would mean somewhere in the 1986–87 range?

Ms. HIRAOKA. I become monk——

Mr. GUTMAN. Nun, nun.

Ms. HIRAOKA. I am sorry. Nun, 1988.

Senator NUNN. 1988. Now, what do you mean by the word "nun"? What does that mean in the Aum religion?

Ms. HIRAOKA. I renounced home life and I devoted my life to salvation for the other people.

Senator NUNN. So the word "nun" means that you have devoted your life to the cause?

Ms. HIRAOKA. I mean devoting my life to save other people, not to cults.

Senator NUNN. You have devoted your life to save other people?

Ms. HIRAOKA. Yes.

Senator NUNN. But is that a religious term in the Aum religion?

Ms. HIRAOKA. Yes.

Senator NUNN. Are there many nuns in the Aum religion? Are you one of many, or are there just a few?

Ms. HIRAOKA. Yes.

Senator NUNN. There are many?

Ms. HIRAOKA. Might be reduced now, but my memory is total number of nuns and monks were 1,000 people, so probably nuns were about 500.

Senator NUNN. And is a monk the same as a nun? A monk is a male and a nun female. Is that correct?

Ms. HIRAOKA. Yes.

Senator NUNN. What caused you to join the Aum organization? If you could interpret that for us?

Ms. HIRAOKA. I wanted to work for the other people for a long time, and also my primary motivation to be a nun was to save the other people, and also Master Asahara recommended me to be a nun.

Senator NUNN. Who recommended?

Ms. HIRAOKA. Master Asahara.

Senator NUNN. Asahara. And you met him where? Where did you meet him—Mr. Asahara?

Ms. HIRAOKA. In Japan.

Senator NUNN. In Japan?

Ms. HIRAOKA. Yes, in my town.

Senator NUNN. In your town in Japan?

Ms. HIRAOKA. Yes.

Senator NUNN. And was he a religious leader at the time you met him?

Ms. HIRAOKA. Yes, he was.

Senator NUNN. Did you hear him make a talk? Did you hear him make a speech, or did you meet him on a personal basis?

Ms. HIRAOKA. I listened to his lecture and after that I met him on a personal basis.

Senator NUNN. Did he give a lecture at a university or was it a town meeting? Where did you hear him lecture?

Ms. HIRAOKA. At a small town meeting.

Senator NUNN. Small town meeting. Did many other people join at that time, or were you one of the few?

Ms. HIRAOKA. Many.

Senator NUNN. Many?

Ms. HIRAOKA. Quite many.

Senator NUNN. Quite a few. What did you do prior to joining the Aum?

Ms. HIRAOKA. I went to junior college to study English literature, and then after the graduation, I taught English to little children.

Senator NUNN. You taught English. If you could go ahead, and when you are giving an answer, even if it is in Japanese, would you please just speak to the microphone so we hear your description and then we hear the interpreter?

Ms. HIRAOKA. Oh, OK. To her?

Senator NUNN. Just speak into the microphone, and then she will pick it up.

Mr. GUTMAN. When you speak in Japanese, speak loud enough so the microphone hears it, and then——

Ms. HIRAOKA. I see. OK.

Senator NUNN. When did you start working for the Aum?

Ms. HIRAOKA. After becoming a monk—a nun.

Senator NUNN. After you became a nun?

Ms. HIRAOKA. Yes.

Senator NUNN. And that was in about 1988?

Ms. HIRAOKA. Yes.

Senator NUNN. Did you become a nun immediately upon joining the organization?

Ms. HIRAOKA. One month after.

Senator NUNN. One month after. And did you accept full-time employment? Was that a full-time job?

Ms. HIRAOKA. Oh, yes.

Senator NUNN. A full-time job. Had you by that stage graduated from college? What was your education?

Ms. HIRAOKA. Yes, I graduated from junior college already at the time.

Senator NUNN. From junior college. Now, how long did you stay in Japan after you went to work for the Aum organization?

Ms. HIRAOKA. About 4 years.

Senator NUNN. OK. If I could ask the interpreted also, when you are interpreting what I am saying, if you could just go ahead and speak in the microphone, I think it is easy to understand for the people who are not seeing who is saying what, whether you are interpreting or whether she is giving direct testimony.

For 1 year; was that right?

Ms. HIRAOKA. About 4 years.

Senator NUNN. About 4 years. When did you come to the United States?

Ms. HIRAOKA. OK. First time to here is 1989.

Senator NUNN. And how long did you stay at that stage?

Ms. HIRAOKA. Around 1 year and a half.

Senator NUNN. About a year and a half?

Ms. HIRAOKA. Yes.

Senator NUNN. And what was your job then?

Ms. HIRAOKA. Assistant.

Senator NUNN. Assistant? And where were you located?

Ms. HIRAOKA. At the time, our New York branch was in Soho in New York.

Senator NUNN. In New York. Did you have an office in New York?

Ms. HIRAOKA. Yes.

Senator NUNN. And who was—you were assistant. Who was your immediate supervisor? Who was your superior?

Ms. HIRAOKA. Manager changes quite frequently, but the manager of the New York City branch office was my boss.

Senator NUNN. And what was his name?

Ms. HIRAOKA. Mr. Joyu Fumihiro and another person is——

Senator NUNN. Mr. Joyu?

Ms. HIRAOKA. Yes. And Ms. Hagesawa.

Senator NUNN. Now, how long were you assistant? How long were you in the position of being assistant?

Ms. HIRAOKA. One year and a half.

Senator NUNN. One year and a half. Then what happened? Did you stay in New York? Did you become the full manager or leader?

Ms. HIRAOKA. I went back to Japan.

Senator NUNN. Went back to Japan.

Ms. HIRAOKA. I went back to Japan.

Senator NUNN. And how long did you stay in Japan at that stage?

Ms. HIRAOKA. Around 2 or 3 years.

Senator NUNN. And when did you come back to the United States?

Ms. HIRAOKA. 1993.

Senator NUNN. 1993. And what was your position when you came back?

Ms. HIRAOKA. New York branch manager.

Senator NUNN. You called your position manager?

Ms. HIRAOKA. Yes.

Senator NUNN. And at that stage you were the boss?

Ms. HIRAOKA. Yes.

Senator NUNN. In the United States.

Ms. HIRAOKA. Yes.

Senator NUNN. Was anyone else in the United States above you, or were you the top person?

Ms. HIRAOKA. At that time or right now?

Senator NUNN. At that time.

Ms. HIRAOKA. At that time I was the manager at the top.

Senator NUNN. And were there any other offices other than New York?

Ms. HIRAOKA. At the time?

Senator NUNN. Yes.

Ms. HIRAOKA. Yes.

Senator NUNN. Where were the other offices?

Ms. HIRAOKA. I'm sorry.

Mr. GUTMAN. Other than in New York.

Ms. HIRAOKA. I made a mistake. We only have our one office in New York.

Senator NUNN. So when you came back in 1993, you had only one office and that office was in New York and you were the manager of that office?

Ms. HIRAOKA. Yes.

Senator NUNN. So you were the top person located in the United States in 1993?

Ms. HIRAOKA. Yes.

Senator NUNN. Are you still in that position today?

Ms. HIRAOKA. Yes.

Senator NUNN. You are the top person in the United States today of the Aum organization?

Ms. HIRAOKA. Yes.

Senator NUNN. And who do you report to back in Japan?

Ms. HIRAOKA. About what?

Mr. GUTMAN. Who gives you orders? Who tells you what to do?

Senator NUNN. Who is your boss in Japan?

Ms. HIRAOKA. Depending on the contents, it is different.

Senator NUNN. Different people.

Ms. HIRAOKA. Different person, yes.

Senator NUNN. Go ahead and talk into the microphone.

Ms. HIRAOKA. However, I tried to talk to the higher stage, higher level people, so I usually consult with the wife of Master Asahara.

Senator NUNN. The wife of Master Asahara?

Ms. HIRAOKA. Yes. The wife of Master Asahara, I consult with Master Asahara, so through his wife I consulted Master Asahara.

Senator NUNN. Do you still communicate with him through his wife today now that he is going through the trial?

Ms. HIRAOKA. No.

Senator NUNN. Well, you don't communicate with her anymore now?

Ms. HIRAOKA. No, I don't. I didn't communicate with her. I didn't communicate with the wife of Master Asahara.

Senator NUNN. You did or did not?

Ms. HIRAOKA. Did not.

Senator NUNN. Did not. Well, I understood you to say you did communicate with her.

Mr. GUTMAN. Up to a certain point.

Senator NUNN. All right. Maybe you could tell us when you stopped communicating with her.

Ms. HIRAOKA. Since there was an accident in Japan.

Senator NUNN. Since the attack in Japan? Since the accident? You said accident in Japan?

Mr. GUTMAN. That's what she—that's how she translated it.

Senator NUNN. You said accident in Japan. And you mean by that the subway——

Ms. HIRAOKA. Yes, yes.

Senator NUNN [continuing]. Chemical——

Ms. HIRAOKA. Yes.

Senator NUNN [continuing]. Tragedy that happened in Japan where people were killed?

Ms. HIRAOKA. Yes.

Senator NUNN. And you termed that an accident?

Ms. HIRAOKA. I'm sorry. I meant it—I meant the accident as sarin gas attack.

Senator NUNN. The accident on sarin gas. Now, since that, in your term, accident in March of 1995, with whom have you communicated? Who is your boss since then?

Ms. HIRAOKA. Since then I don't have—I don't understand who is my immediate boss anymore. I don't have a clear understanding. So depending on the contents of the question, I consult it to the appropriate person.

Senator NUNN. But there are several people you still talk to on the phone or by correspondence? You still are in touch with people in Japan in the Aum organization today?

Ms. HIRAOKA. Yes. Not often, but yes.

Senator NUNN. How do you communicate? Mainly by telephone, is that right?

Ms. HIRAOKA. Yes, over the telephone or fax.

Senator NUNN. Fax or telephone.

Ms. HIRAOKA. Yes.

Senator NUNN. Now, what are your duties with the Aum organization? What are your responsibilities?

Ms. HIRAOKA. In the New York branch?

Mr. GUTMAN. Yes.

Senator NUNN. Well, or any other duties you may have, New York branch, but other duties also?

Ms. HIRAOKA. OK. New York.

The main activity of the New York branch office is the religious activities. We also deal with book sales, the Aum publishment. We teach the members and non-members yoga and meditation method and teach the law of the truth or Buddhist dogma, and the purpose of that is to have a spiritual development of the other people.

Rarely, I was asked to check and do the research from Japan. Most of them are to purchase the books on Buddhism and purchase of the videos of the Buddhism.

Senator NUNN. How many books do you sell in a year?

Ms. HIRAOKA. It is about 100 books per year in New York City but it is—whole United States.

Senator NUNN. About 100 books a year?

Ms. HIRAOKA. Yes.

Senator NUNN. What price do you sell the books for? What is the price?

Ms. HIRAOKA. Depending on the book, it's different.

Senator NUNN. Just the range.

Mr. GUTMAN. What's the cheapest and the highest?

Ms. HIRAOKA. OK. The cheapest is $6.95. Highest is $14.

Senator NUNN. How much do you get paid?

Ms. HIRAOKA. Me?

Mr. GUTMAN. Yes.

Ms. HIRAOKA. I don't have a payment. I don't have a salary. They give me pocket money.

Senator NUNN. Pocket money.

Mr. GUTMAN. Tell him how much.

Senator NUNN. They pay all your expenses, your expenses for living in New York?

Ms. HIRAOKA. Yes, for the rent, Aum Shinrikyo is paying for my rent.

Senator NUNN. Pays the rent. How many people work for you?

Ms. HIRAOKA. Right now? I'm the only one staff.

Senator NUNN. What about in 1993 when you first took over as manager? How many people did you have working for you then?

Ms. HIRAOKA. Two people.

Senator NUNN. Two people? And how were they paid? Did you pay them?

Ms. HIRAOKA. None of them had regular salary.

Senator NUNN. You just also paid them with what you call pocket money?

Ms. HIRAOKA. Yes, they received pocket money.

Senator NUNN. Is that paid with a check or is it paid with cash?

Ms. HIRAOKA. Cash.

Senator NUNN. Cash. And where do you get the cash?

Ms. HIRAOKA. Where did I get the cash from?

Senator NUNN. Who gives you the cash?

Ms. HIRAOKA. I was the one who got it.

Senator NUNN. Well, where did you get the cash from that you gave them? Where did you get your cash from? Where was it—from where was the cash derived? From whom?

Ms. HIRAOKA. In New York branch office, our income source was the donation of the members and support from the Japanese Aum Supreme Court.

Senator NUNN. But when you got cash, was that cash sent to your from Japan, or was it cash raised from members in this country, or both?

Ms. HIRAOKA. Both.

[Witness confers with counsel.]

Ms. HIRAOKA. I'm sorry. I can't get your questions. I can't get your point.

Senator NUNN. Well, let's go ahead to another question. How many members did you recruit? How many members of the Aum do you have now?

Ms. HIRAOKA. Around 25.

Senator NUNN. In the United States?

Ms. HIRAOKA. Yes.

Senator NUNN. About 25 members?

Ms. HIRAOKA. Yes.

Senator NUNN. Very small group.

Ms. HIRAOKA. Very small.

Senator NUNN. And how many of those people are paid by the Aum?

Ms. HIRAOKA. The 25 members mentioned are the members, but they are not monk nor nun, so they don't receive any money from Aum Supreme Court.

Senator NUNN. OK. So they do not receive pay, then. They are just——

Ms. HIRAOKA. No.

Senator NUNN. They are members.

Mr. GUTMAN. Tell him how much you get.

Ms. HIRAOKA. Money?

Senator NUNN. Yes. Approximately how much pocket money do you get a year?

Ms. HIRAOKA. For monk and nun?

Mr. GUTMAN. You, personally.

Ms. HIRAOKA. OK. One month is $80. Eighty dollars.

Senator NUNN. Eighty dollars how often?

Ms. HIRAOKA. One month.

Senator NUNN. One month.

Ms. HIRAOKA. Yes. This is the pocket money from monk and nun.

Senator NUNN. Can you live off of $80 a month?

Ms. HIRAOKA. Because only for my belonging.

Senator NUNN. OK. They pay your rent?

Ms. HIRAOKA. Yes.

Senator NUNN. They pay your rent.

Ms. HIRAOKA. Yes.

Senator NUNN. And you live near your office? Do you live near your office?

Ms. HIRAOKA. In the office. I live in the office.

Senator NUNN. You live in the office?

Ms. HIRAOKA. Yes.

Senator NUNN. Who is the leader of the Aum organization worldwide?

Ms. HIRAOKA. I think Master Shoko Asahara.

Senator NUNN. Master Asahara?

Ms. HIRAOKA. Master Shoko Asahara.

Senator NUNN. Is he also known as Matsumoto?

Ms. HIRAOKA. His real name is Chizuo Matsumoto.

Senator NUNN. His real name is Matsumoto?

Ms. HIRAOKA. Matsumoto.

Senator NUNN. And Asahara is a religious name?

Ms. HIRAOKA. I don't know.

Senator NUNN. You don't know. Did Mr. Asahara authorize the opening of the New York office?

Ms. HIRAOKA. At that time I was not there, so I was not sure, but I think so.

Senator NUNN. Do you know how many members there were in other parts of the world, or is your knowledge mainly limited to New York?

Ms. HIRAOKA. Before the sarin gas attack in Japan, I heard that in Russia there are 30,000 members and in Germany there are one or two, and about 100 members in Sri Lanka, but it might be a different number now.

Senator NUNN. Did you talk to other members in other parts of the world frequently, like Germany? Did you talk to people that belonged to Aum in Germany?

Ms. HIRAOKA. Very rarely I talked to the people in branch office in Germany.

Senator NUNN. Did you hear Mr. Asahara preach or give lectures about a battle with the United States, between Japan and the United States?

Ms. HIRAOKA. Yes.

Senator NUNN. And did you hear that when you first joined the Aum? When did you hear him give those lectures about a battle between Japan and the United States?

Ms. HIRAOKA. I listened to him lecturing about U.S. about war in 2 years—in these 2 years.

Senator NUNN. Which 2 years?

Ms. HIRAOKA. Most recent.

Senator NUNN. Most recently?

Ms. HIRAOKA. Yes.

Senator NUNN. Did he give this kind of lecture when you first joined in 1988, or was it just in the most recent 2 years?

Ms. HIRAOKA. Only recently, not in the past.

Senator NUNN. Could you tell us about that in your own words? Could you describe what he was predicting?

Ms. HIRAOKA. About the war between Japan and America?

Senator NUNN. Yes. What did he say about that?

Ms. HIRAOKA. The Japanese economic situation will be stagnated, and there will be a war in Japan and many Japanese people will be harmed.

Senator NUNN. Did he say that the war would be with the United States?

Ms. HIRAOKA. Yes, he did.

Senator NUNN. So it was going to be a war between Japan and the United States?

Ms. HIRAOKA. Yes.

Senator NUNN. When did he predict this would occur?

Ms. HIRAOKA. I don't recall the exact date, but I guess I heard it will occur in a few years.

Senator NUNN. In the next few years?

Ms. HIRAOKA. Yes.

Senator NUNN. Did you believe that?

Ms. HIRAOKA. At that time when I heard the lecture, I believed that. But now I started to doubt it.

Senator NUNN. When did you start to doubt that?

Ms. HIRAOKA. Recently when there was the trial in Japan, I began to doubt Master Asahara's prediction, whether it's true or not.

Senator NUNN. Could you tell us what you know about the subway—in your words, you called it an accident—the subway accident that occurred in March of 1995 in Tokyo? Could you tell us what you know about that?

Mr. GUTMAN. If I may, Senator, I realize that the word "accident" was used in the translation, but if we could go back, what is the Japanese word she used and was it really "accident" or "incident" or something else?

Ms. HIRAOKA. All I know about that sarin gas attack is through the media and what I listened—what I heard.

Senator NUNN. Just your news media reports is all you know?

Ms. HIRAOKA. Yes.

Senator NUNN. No one called you from Tokyo or anywhere else and explained to you what happened?

Ms. HIRAOKA. No.

Senator NUNN. Did you intend to use the word "accident"?

Mr. GUTMAN. You understand the difference between "accident" and "incident"?

Ms. HIRAOKA. Yes. My English is not good. I'm sorry.

Senator NUNN. Right, right.

Ms. HIRAOKA. That's why maybe "accident" is not right word.

Senator NUNN. So you mean to use the word "incident"?

Ms. HIRAOKA. Yes. Yes.

Senator NUNN. I was going to ask you if you had any reason to believe it was an accident rather than a deliberate attack.

Ms. HIRAOKA. I don't know.

Senator NUNN. You don't know?

Ms. HIRAOKA. I don't know.

Senator NUNN. Did anyone ever call you from Japan after March of 1995 in the Aum organization or otherwise and explain to you what had happened in that Tokyo tragedy?

Ms. HIRAOKA. No.

Senator NUNN. No one ever did?

Ms. HIRAOKA. No.

Senator NUNN. Did you talk to Mr. Asahara after March of 1995?

Ms. HIRAOKA. I don't remember clearly. I don't remember if that was before or after the accident—after that sarin attack, but only once he called me——

Mr. GUTMAN. There again we have the word "accident." I don't think that is what she——

Ms. HIRAOKA. Incident.

Mr. GUTMAN. Incident.

Senator NUNN. Incident. So you did talk to him, but you do not know whether it was before or after March of 1995?

Ms. HIRAOKA. Probably after the March 20.

Senator NUNN. You think you talked—you believe you talked to Mr. Asahara after the March 1995 attack?

Ms. HIRAOKA. He called me, yes.

Senator NUNN. He called you?

Ms. HIRAOKA. Yes.

Senator NUNN. Can you tell us what he told you?

Mr. GUTMAN. Simply, what did he say to you?

Ms. HIRAOKA. I was asked to tell one statement to the American media.

Senator NUNN. And what was that statement?

Ms. HIRAOKA. I don't think I can remember very well.

Senator NUNN. Just tell us what you remember, your best memory of what he told you.

Ms. HIRAOKA. Master Asahara said, the statement was——

Senator NUNN. Excuse me. Talk right into the mike, if you would.

Ms. HIRAOKA. It's a kind of religious suppression, and we are the earnest Buddhist organization. So we have no relation to that Tokyo gas attack.

Senator NUNN. When you say that he told you it's a kind of a religious operation—is that what you said?

Ms. HIRAOKA. Religious suppression.

Senator NUNN. Suppression. What do you mean by it's a kind of religious suppression? What does that mean?

[Witness confers with counsel.]

Mr. GUTMAN. She doesn't really understand the question.

Senator NUNN. Well, we are just really trying to get her to say in her own words what he told her.

Mr. GUTMAN. I understand.

Senator NUNN. That is the question.

Ms. HIRAOKA. He meant—the religious suppression means that the people—the Japanese Government blame Aum for the Tokyo gas attack.

Senator NUNN. Did you talk to him just one time, or did you talk to him several times after the March 1995 attack?

Ms. HIRAOKA. That was only one time.

Senator NUNN. Only one time. And he called you?

Ms. HIRAOKA. Yes.

Senator NUNN. Have you talked to his wife since March of 1995?

Ms. HIRAOKA. No.

Senator NUNN. Do you know Mr. Hiramatsu?

Ms. HIRAOKA. Yes.

Senator NUNN. Was he a member of the Aum organization?

Ms. HIRAOKA. He was monk.

Senator NUNN. He was a monk. Was he in Japan or was he in the United States?

Ms. HIRAOKA. In Japan.

Senator NUNN. He was in Japan? Was he a higher rank than you? Was he your boss? Did you report to him?

Ms. HIRAOKA. He was a little bit higher than me.

Senator NUNN. He was a little higher up?

Ms. HIRAOKA. Yes.

Senator NUNN. Did he give you directions?

Ms. HIRAOKA. Yes.

Senator NUNN. He gave you instructions?

Ms. HIRAOKA. Yes.

Senator NUNN. Did Mr. Hiramatsu ask you to help him buy certain goods from America?

[Counsel confers with witness.]

Ms. HIRAOKA. Mr. Hiramatsu told me on the phone and by fax—he gave me the direction to do this and to do that, so I followed his directions.

Senator NUNN. So he was the person you took directions from in terms of making purchases in the United States?

Ms. HIRAOKA. Yes.

Senator NUNN. Did you know, do you know a company by the name of Maha Posya?

Ms. HIRAOKA. Maha Posya?

Senator NUNN. Maha Posya.

Ms. HIRAOKA. Yes.

Senator NUNN. Could you tell us what you know about that company?

Ms. HIRAOKA. All I know is they are selling the computers.

Senator NUNN. They are?

Ms. HIRAOKA. Selling the computers.

Senator NUNN. Selling computers. Are you familiar with a corporation in Connecticut by the name of Zygo?

Ms. HIRAOKA. I have heard of it.

Senator NUNN. Did you have conversations with Zygo? Did you try to make purchases there?

Ms. HIRAOKA. I called up them because Mr. Hiramatsu or Mr. Maki—I don't remember clearly—gave me the direction.

Senator NUNN. Excuse me. Would you repeat that?

Ms. HIRAOKA. Mr. Hiramatsu or Mr. Maki—I don't remember which one—gave me the direction, and I followed their direction, and I contacted them.

Senator NUNN. So you did contact Zygo Corporation?

Ms. HIRAOKA. Yes.

Senator NUNN. And you were taking direction from Mr. Hiramatsu?

Ms. HIRAOKA. Either Mr. Hiramatsu or Mr. Maki. I don't remember.

Senator NUNN. Someone.

Ms. HIRAOKA. Someone.

Senator NUNN. And they told you what to buy; then you tried to buy it. Is that right?

Ms. HIRAOKA. Yes, he just—yes, he gave me that in a fax to—he sent a fax to me to do something, so I just did what he told me to do.

Senator NUNN. Did you assist Mr. Hiramatsu in his attempt to purchase a very expensive laser measuring device?

Ms. HIRAOKA. As for the purchase of this machine, I don't remember it clearly.

Senator NUNN. You don't?

Ms. HIRAOKA. Remember it clearly.

Senator NUNN. You did try to purchase that type machine, though; is that right?

Ms. HIRAOKA. I don't remember. Some kind of machine, but I don't remember.

Senator NUNN. You don't remember what kind of machine? You did try to make purchases from Zygo Corporation, though; is that right?

Ms. HIRAOKA. I just followed the direction from Japan.

[Witness confers with counsel.]

Ms. HIRAOKA. Usually, this process—I will explain how I communicate, how I get the direction, and how I follow the direction from Mr. Maki and Mr. Hiramatsu.

Senator NUNN. OK.

Ms. HIRAOKA. When I received fax from Mr. Maki or Mr. Hiramatsu, fax, I just simply cut out the Japanese part at the top, and I send the company the—I make a copy, then I send the fax to them.

Senator NUNN. Did you know what the use of this equipment was intended to be?

Ms. HIRAOKA. I don't know.

Senator NUNN. You didn't know about that?

Ms. HIRAOKA. I didn't know about that.

Senator NUNN. Did you ever ask the question, what is this going to be used for?

Ms. HIRAOKA. I just——

Senator NUNN. The question is: Did you know that these devices that you were attempting to purchase based on the orders you had gotten were devices that could be used for military purposes?

Ms. HIRAOKA. I didn't know that.

Senator NUNN. You did not know that?

Ms. HIRAOKA. I didn't know that.

Senator NUNN. Did you have any discussions with the people in Japan about how they were going to use this equipment?

Ms. HIRAOKA. No.

Senator NUNN. You did not?

Ms. HIRAOKA. No.

Senator NUNN. So your testimony is you were simply carrying out their orders?

Ms. HIRAOKA. Yes.

Senator NUNN. Are you familiar with a company called Biosym Technologies, Inc.?

Ms. HIRAOKA. Yes, I heard of that.

Senator NUNN. You've heard of that?

Ms. HIRAOKA. Yes.

Senator NUNN. Did you make an order there? Did you try to make some purchases there?

Ms. HIRAOKA. I follow the same procedure as I explained before. I got the direction from Japan, and I follow the direction.

Senator NUNN. Did you know what the equipment would be used for?

Ms. HIRAOKA. I don't know.

Senator NUNN. You did not. Do you recall being asked by Mr. Hiramatsu or Mr. Maki to find out about how to make military knives?

[Counsel confers with witness.]

Ms. HIRAOKA. What I remember about this subject is I remember either Mr. Maki or Mr. Hiramatsu contacting me, and they told me that in order to make an army knife in Japan, they are looking for steel. And they told me the specific thickness and weight to make the army knife.

Senator NUNN. Did you try to purchase steel?

Ms. HIRAOKA. At that time I contacted many companies to look for the specific steel.

Senator NUNN. How much was the quantity? What quantity of steel?

Ms. HIRAOKA. I don't remember it well, but something with tons.

Senator NUNN. Tons of steel. Tons, lots of steel?

Ms. HIRAOKA. I don't remember.

Senator NUNN. You don't remember exactly. Did Mr. Hiramatsu come to New York and take documents after the March 1995 attack?

Ms. HIRAOKA. Yes.

Senator NUNN. He came to your office?

Ms. HIRAOKA. Yes.

Senator NUNN. Do you remember when that was?

Ms. HIRAOKA. Around March or—around March.

Senator NUNN. In March of 1995?

Ms. HIRAOKA. March or April or——

Senator NUNN. Did he take most of the paper and documents in your office?

Ms. HIRAOKA. Not all of them, but something related to his business.

Senator NUNN. He took most of the documents relating to the purchasing?

Ms. HIRAOKA. Yes.

Senator NUNN. And most of the financial records?

Ms. HIRAOKA. Yes, financial records and bank records.

Senator NUNN. He took most of the documents relating to purchasing most of the financial records and most of the bank records?

Ms. HIRAOKA. Also by faxing and correspondence.

Senator NUNN. And most of the faxes going back and forth?

Ms. HIRAOKA. Yes.

Senator NUNN. Did you say yes?

Ms. HIRAOKA. Yes.

Senator NUNN. Did he tell you why?

Ms. HIRAOKA. Because New York branch office might be investigated by police.

Senator NUNN. Might be investigated by police and that's the reason he took the records.

Ms. HIRAOKA. Yes.

Senator NUNN. Did he indicate that they might be investigated relating to the March attack in Tokyo?

Ms. HIRAOKA. No, he didn't say anything.

Senator NUNN. He didn't say anything about that?

Ms. HIRAOKA. No.

Senator NUNN. Did anyone in the Aum organization ever tell you—anyone, not just the one we have talked about—that the attack in Tokyo had been carried out by the Aum organization?

Ms. HIRAOKA. From Japan or——

Senator NUNN. Any member of the organization?

Ms. HIRAOKA. No. I told you, I got only this information through media.

Mr. GUTMAN. So the question is did anyone of them ever say to you, yes, we did it?

Ms. HIRAOKA. Oh. No, I haven't heard any.

Senator NUNN. Nobody ever told you they carried out the attack?

Ms. HIRAOKA. No. I didn't.

Senator NUNN. If Mr. Hiramatsu or Mr. Maki called you today and asked you to contact U.S. companies to buy equipment, would you carry out those orders?

Ms. HIRAOKA. No.

Senator NUNN. You would not?

Ms. HIRAOKA. No.

Senator NUNN. Why?

Ms. HIRAOKA. Because--well, let me tell you my feeling. We are strict Buddhists, and we follow—we strictly follow non-violence. We don't even kill insects. And we are hoping for the people's liberation from the suffering.

But if part of Aum Shinrikyo people did—were involved in sarin attack and other incidents, accidents, I truly regret it, and I am really feeling sad about it.

[Pause.]

Mr. GUTMAN. Can you catch up with that?

Senator NUNN. Yes, why don't you tell us what she said now at this point?

Ms. HIRAOKA. I have been watching the trial very closely, and until Aum prove its innocence definitely, I do not—I don't think I should—I should be reserved.

Senator NUNN. Thank you for testifying. We appreciate your testimony, and we may need to get back in touch with you through your attorney.

Mr. Gutman, we appreciate your cooperation.

Mr. GUTMAN. Thank you for your courtesy.

Ms. HIRAOKA. Thank you.

Senator NUNN. We will have all the cameras now turned away, and we will resume this hearing tomorrow morning. When all the cameras have been turned away, you can have the witness leave the room.

I have to go vote, so I am going to leave.

Mr. GUTMAN. Thank you, Senator.

Senator NUNN. We will include in the record a letter from the Australian Embassy.[1]

[Whereupon, at 2:31 p.m., the Subcommittee was adjourned.]

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[1] The letter appears as Exhibit No. 13b in the Appendix on page 608.

GLOBAL PROLIFERATION OF WEAPONS OF MASS DESTRUCTION

WEDNESDAY, NOVEMBER 1, 1995

U.S. SENATE,
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 9:32 a.m., in room 342, Dirksen Senate Office Building, Hon. Ted Stevens, presiding.

Present: Senators Stevens, Nunn, Cohen, Cochran, Glenn, and Levin. Also present: Senator Lugar [ex officio].

Staff Present: Daniel S. Gelber, Chief Counsel to the Minority; John F. Sopko, Deputy Chief Counsel to the Minority; Mary D. Robertson, Assistant Chief Clerk to the Minority; Alan Edelman, Counsel to the Minority; Mark Webster, Investigator to the Minority; Renee Pruneau-Novakoff (Detailee, CIA); Richard Kennan (Detailee, U.S. Customs); Harold Damelin, Chief Counsel and Staff Director; Eric Thorson, Chief Investigator; Michael Bopp, Counsel; Stephen H. Levin, Counsel; Carla J. Martin, Chief Clerk; Mary Ailes, Staff Assistant; Katherine O'Connor, Receptionist; Albert McDermott (Governmental Affairs Committee); Randy Rydell (Senator Glenn); Matt Sikes (Senator Nunn); Jim Bodner (Senator Cohen); Ken Myers (Senator Lugar); Rick Valentine (Senator Smith); Leonard Weiss (Governmental Affairs Committee); and Matthew Sikes (Senator Levin).

OPENING STATEMENT OF SENATOR STEVENS

Senator STEVENS. Good morning. Yesterday, during the opening day of these hearings, the Committee heard detailed testimony regarding how the Aum Shinrikyo, a Japanese religious cult with members worldwide, apparently carried out chemical weapons attacks on the people of Japan. Yesterday's testimony painted a gloomy picture of how easily an organization bent on destruction can arm itself with chemical and biological weapons and how even the crude deployment of these weapons can be deadly.

The Aum's chemical weapons attacks portray the threat from the proliferation of chemical and biological weapons as very much a reality, one that the United States and all nations must be aware of, must prepare for, and must work against.

Today, this Committee turns from the shocking activities allegedly undertaken by the Aum to an examination of how we can minimize such threats and whether we are prepared to respond to them if the need arises. Our witnesses will examine the problems experienced by the states of the former Soviet Union in protecting their massive chemical and biological weapons stockpiles, problems exacerbated by their struggles to adjust to democratic governments and market economics.

The Committee will also hear from representatives of the agencies that have the Federal responsibility for combatting the threat of and responding to terrorist incidents, particularly those that involve weapons of mass destruction. After yesterday's disturbing testimony, we are all looking forward to hearing how well prepared we are to deal with the threat of chemical or biological weapons attack with the hope that we may determine what else our citizens must do to protect themselves and ourselves against this threat.

Again, Senator Nunn, I commend you for these hearings and the minority staff for conducting the investigation. This is a difficult period for us. I go to another committee chairmanship and will probably not be back today, although I will try to get back. I do hope that you will call upon us if there is anything we can do to assist you, but once again, I turn the gavel over to you.

OPENING STATEMENT OF SENATOR NUNN

Senator NUNN [presiding]. Thank you very much, Mr. Chairman. I know you are going to have to come and go during these hearings, Mr. Chairman, but I want to thank you very much and thank Senator Roth and all the cooperation we have had from the majority.

This Subcommittee has been unique for years. Senator Roth has been Chairman of it. I have been Chairman of it. I have been ranking member and he has been ranking member and we have always run it on a non-partisan basis. The minority has a much smaller staff, but we are able to run our own investigations in close concert and coordination with the majority. So in many ways, this is a unique Subcommittee. Mr. Chairman, I appreciate very much your splendid cooperation.

I might also say, Senator Stevens, that your role on the Appropriations Committee in dealing with the funding for the various elements of our nonproliferation effort is absolutely crucial and you have been a stalwart in supporting the Cooperative Threat Reduction Program, the Nunn-Lugar program, and all of the programs that are dealing with these matters that we are going to hear during the course of the day, some of the soft spots and some of the areas where we really need to beef up.

I thank you for what you have already done. You have been a real leader in this area and I know that we will continue to work together very closely. Senator Cohen and Senator Lugar are here again today and they have been, of course, leaders in this whole effort on nonproliferation also.

Yesterday, we established the frightening case of the Aum Shinrikyo, the doomsday cult that carried out the sarin gas attack on the Tokyo subway system in March of this year, killing 12 and injuring over 5,000. The testimony showed this cult, which preached a philosophy of Armageddon between the United States and Japan, was a clear danger not only to the Japanese government but also to the security interest of the United States.

As we heard yesterday, the Aum was a worldwide organization with tens of thousands of members, including scientists and technical experts in Japan and Russia who were recruited to develop weapons of mass destruction. The cult produced chemical weapons, including toxic chemical agents such as sarin, VX, phosgene, and sodium cyanide and had successfully used sarin on at least two occasions against large groups of innocent civilians. The Aum scientists were in the process of developing biological weapons, including anthrax, botulinum toxin, and "Q" fever.

The cult actively engaged in obtaining sensitive technologies in the United States. We heard the leader of the cult from New York yesterday admit that she had engaged in purchasing technology to assist in weapons development, and they had acquired conventional armaments and attempted to acquire technology relating to weapons of mass destruction and technologies from the former Soviet Union as well as elsewhere.

The Aum produces a remarkable example of the threat modern terrorism poses to all civilized nations. The cult's rise and its efforts to obtain and use weapons of mass destruction raise numerous policy issues, however, that extend well beyond the specific threat posed by Asahara and his followers. The ease with which the Aum accessed the vast international supermarket of weapons and weapons technology is particularly troubling, especially in light of the current state of the economies and governments of the former Soviet Union.

How much this cult acquired that we do not know about and how much more they could have obtained is a major unanswered question. How much the next group may be able to acquire is perhaps an even more important question.

We will explore some of these issues with our first panel this morning as they discuss the security and accountability of chemical and biological weapon stockpiles in the former Soviet Union and the effectiveness of various arms control and nonproliferation regimes. Included in this panel is a former Russian chemical weapons scientist who will discuss his concerns with the controls over the massive stockpiles of weapons in Russia.

Another troubling aspect of this case is that despite the Aum's overt and far-flung activities, no U.S. law enforcement or intelligence agency perceived them as dangerous, much less a threat to national security, prior to the March 20 subway attack this year. How does a fanatic intent on triggering an Armageddon between the United States and Japan with virtually unlimited funds and a worldwide network of operatives escape the notice of Western intelligence and law enforcement? What happened to the coordination between the United States and Japan?

These are important and disturbing questions which we will explore with our second panel later this morning. They include Government representatives from law enforcement, the intelligence community, and public health services.

The case of the Aum can provide us with many instructive lessons about weapons proliferation, about the capabilities and limitations of intelligence and law enforcement, and about the adequacy of our medical and civil preparedness. It is my hope, Mr. Chairman, that with this set of hearings we will begin the important process of learning these lessons.

OPENING STATEMENT OF SENATOR COHEN

Senator COHEN. Thank you very much, Senator Nunn.

As Senator Stevens indicated yesterday, because of your long work in this area and your leadership in this area, it is appropriate that you, in fact, should be serving as Chairman of the hearing. I think your statement has covered the basic elements that we wish to pursue this morning and we should proceed, unless, Senator Lugar, would you like to make a statement?

OPENING STATEMENT OF SENATOR RICHARD G. LUGAR

Senator LUGAR. I have just a short statement, Mr. Chairman, and I will not cover the same ground that Senator Nunn has covered.

We were told yesterday that the Japanese cult was "not on the radar screen" of U.S. law enforcement and intelligence agencies before the sarin gas attack. That is surprising, considering the cult had accumulated over $1 billion in assets and established offices in six countries on four continents. Obviously, the response of the United States to this threat has not begun to approximate our stakes in the matter.

A new level of commitment, effort, and resources is required, and that obviously is the basic reason for this hearing today. We need an effective mechanism to integrate the full range of policy tools in order to address effectively the dangers to our country from the proliferation of weapons and materials of mass destruction.

I look forward to hearing the panelists.

I thank you, Mr. Chairman.

[The prepared statement of Senator Lugar follows:]

PREPARED STATEMENT OF SENATOR LUGAR

Yesterday, we heard testimony on the worldwide activities of the so-called Japanese "Dooms-Day Cult." We were told that the Japanese cult was not "on the radar screen" of U.S. law enforcement and intelligence agencies before the sarin gas attack on the Tokyo subway last March. This is surprising, considering the cult accumulated over $1 billion in assets and established offices in six countries on four continents.

Cult members actively recruited scientists and technical experts in Japan, Russia, and elsewhere in order to develop weapons of mass destruction. They succeeded in producing chemical weapons, including toxic chemical agents such as Sarin, VX, and sodium cyanide; and they were in the process of developing biological weapons, including anthrax, botulism, and "Q" fever.

We learned how close we came to witnessing acts of nuclear, chemical, and biological terrorism directed toward the United States. We were told how much more devastating the attacks in Tokyo could have been if the cult had simply waited a little longer and perfected their delivery systems. While the probability of a large scale nuclear, chemical, and biological exchanges between Russia and the United States has mercifully decreased since the end of the cold War, the probability of one or several weapons of mass destruction detonating in Japan, Russia, Europe, the Middle East or even the United States has increased.

This morning, we must look to the future to determine what the United States and its friends and allies must do to guard against such threats. The United States must devise a program of action that is as focused, serious, and vigorous as our strategy during the Cold War. If we do not, then I believe the United States has every reason to anticipate acts of nuclear, chemical, and biological terrorism against American targets before this decade is out.

To date, the U.S. response to this new threat has not even begun to approximate U.S. stakes in the matter. A new level of commitment, effort, and resources is required. We need a multifaceted, integrated strategic response to the challenge of technology diffusion.

It is clear to me following yesterday's hearing that what we need today is an effective mechanism to integrate the full range of policy tools in order to address effectively the dangers to this country from the proliferation of weapons and materials of mass destruction.

During the course of yesterday's hearings, several Members focused on the need for effective inelligence in countering proliferation successfully.

Some witnesses yesterday emphasized the need for effective defense programs in order to counter the proliferation of weapons of mass destruction.

We have also dealt in other hearings with the use of military force to deal with the problem of proliferation.

Subcommittee staff discussed yesterday the utilization of export controls as a centerpiece of U.S. nonproliferation efforts.

And lastly, reference was made repeatedly during yesterday's hearing to the several contributions that arms control treaties and agreements can make to the fight against proliferation. Senator Nunn and I both cited the Chemical Weapons Convention that has been submitted to the Senate, and asked what contribution that Convention might have made in dealing with the circumstances that gave rise to the Tokyo subway attack.

We all recognize that, as with any other policy instrument, arms control and the Chemical Weapons Convention in particular, is not the total answer. No one should expect the CWC to carry more of a burden than it was intended to bear. By the same token, the CWC may help us to reduce the scope of the chemical problem to more manageable proportions, and, for that reason, it must be considered in combination with other policy tools.

I would hope that we might explore with our witnesses today an appropriate package of policy tools that will aid us in coping with a threat that is real and that will be with us for many years to come.

Senator COHEN. Thank you very much, Senator Lugar.

Senator NUNN. We swear in all the witnesses for our Subcommittee, so if all of you will rise and raise your right hand and take the oath.

Do you swear the testimony you give before this Subcommittee will be the truth, the whole truth, and nothing but the truth, so help you, God?

Ms. SMITHSON. I do.

Dr. MIRZAYANOV. I do.

Mr. LEITENBERG. I do.

Mr. MOODIE. I do.

Senator NUNN. Thank you. I believe this morning we are going to lead off, Mr. Chairman, with Amy Smithson, who is a Senior Associate at the Henry L. Stimson Center. Amy, we are glad to have you this morning.

TESTIMONY OF AMY E. SMITHSON, SENIOR ASSOCIATE, HENRY L. STIMSON CENTER

Ms. SMITHSON. Thank you very much.

Because we have lived under the shadow of a potential nuclear holocaust for over half a century, an incredible amount of time and energy has been focused on preventing the accidental or intentional launch of nuclear weapons. Few would argue that this was not time well spent, but it is often the less-obvious threat that materializes. Therefore, I would like to thank this Committee for looking into the threat that chemical and biological weapons pose to the safety and security of U.S. soldiers and citizens.

Since the end of the Cold War has pulled us back from the nuclear brink, the threat that we face from chemical and biological weapons is equally, if not more, tangible than the nuclear weapons threat. This argument gains credibility in the aftermath of recent events in Tokyo. The testimony that we heard yesterday was quite shocking, and this event was a wake-up call for me. In fact, it prompted me to examine more closely the security of Russia's chemical weapons stockpile, which even at the declared level of 40,000 metric tons is the world's largest.

Russia's declared stockpile is stored at seven different sites, as this map shows. I interviewed individuals who had been to four of these seven sites. The results of my research are presented in my prepared statement, which I will summarize for you now.

Senator NUNN. All of your complete statements will be part of the record and entered into the record, so your summaries will highlight that and your complete statement will be in the record. I have read the statements, as well.

Ms. SMITHSON. Thank you. Physical security is a catch-all term for the barriers, such as fences, that are supposed to impede an attack on one of these sites until the guards can respond. The physical security at these sites is not nearly as abundant nor as advanced as the measures one would find at sensitive Western military bases. In fact, it was characterized as similar to what one would find at a U.S. chemical weapons storage sites in the 1950s. One eyewitness described this physical security as "good enough to keep an honest man out."

Gaps in physical security were more evident in some cases than in others. For instance, perimeter lights were seen at two of these sites, although they were few in number and appeared to be poorly maintained, but they were not seen at two other sites. The railway entrances into these facilities appeared to be a particularly egregious security shortcoming. No guards were seen at these gates, which were closed only with a padlock.

If we can bring up the second chart now, I would like to talk for a moment about the physical security that was observed at individual storage buildings. Some of these buildings are made of wood and have wooden doors. Others are made of concrete blocks, but at the rear of these buildings, there are large mesh grills. At three of the sites that were visited, the only physical barrier to the entrance of these buildings was a single-key padlock.

Intrusion detection devices, in this instance rudimentary circuit breakers, were observed on the doors of the buildings at one of these sites and possibly at another site. Such devices were not observed on the buildings at the two other sites that were visited, nor for that matter were electronic intrusion detection sensors observed at the perimeter of any of the four sites.

Senators you do not have to be an expert in security to see the problems here. It would appear that all that is necessary to gain entrance into these storage buildings is a bribe, a dark night, some dark clothing, a little bit of muscle, and a crowbar. Yes, I said a crowbar. You do not need dynamite to jimmy a padlock, pry open a mesh grill, or loosen the boards on a wooden building. Many American homes have more sophisticated and probably more abundant physical security than was observed at these storage buildings.

Perhaps it is useful to recall at this point that some 32,000 metric tons of Russia's arsenal are lethal nerve agents. Some of these munitions, such as artillery shells, weigh between 90 and 100 pounds when they are fully loaded. They are quite portable. These same artillery shells can be fired from any of the tens of thousands of Soviet-made artillery pieces that are scattered around the globe.

Furthermore, because tamper-proof seals are apparently not being used across the board, it appears that chemical agent can be siphoned from bulk storage containers.

Such deficiencies in physical security are compounded by the methods that are apparently being used to keep track of Russia's chemical arsenal, which offer opportunities for insider theft. All in all, Russia's chemical weapon storage sites may well be more vulnerable to theft from within and attack from without than Russia's nuclear facilities.

Given these circumstances, I have two recommendations to offer. First, prudence would dictate that additional funds quickly be set aside to help buttress the security at these sites via the Nunn-Lugar Cooperative Threat Reduction Program. Perimeter security could be strengthened by adding lights and closed-circuit TV, which would allow guards to more rapidly identify and respond to intruders. More rugged locks, doors, and tamper-proof seals are also in order. These and other measures could markedly enhance the security of these facilities.

The amount called for is modest in comparison to most defense expenditures, on the order of tens of thousands, not hundreds of millions. To date, $55 million has gone to assist Russia's chemical weapons destruction program. These resources are being put to very good use, so I am not suggesting that Peter be robbed to pay Paul.

Second, the quickest route to bring outside inspectors into these facilities to inventory and further secure these weapons is through the Chemical Weapons Convention. As of this month, this treaty has been waiting 2 years for an up or down vote in the Senate. I am deeply concerned that the Senate has not recognized the opportunities that the Convention presents to address not only Russia's assorted chemical weapons problems but the worldwide problem of chemical weapons proliferation.

With your permission, Mr. Chairman, I would like to use this opportunity to introduce a new Stimson Center report. The title just about says it all.

Senator NUNN. What is the title?

Ms. SMITHSON. The U.S. Senate and the Chemical Weapons Convention: The Price of Inaction.[1]

The costs of the Senate's failure to provide its consent to ratify this treaty are more palpable with each passing day. Without the Convention, there is a gaping hole in U.S. nonproliferation policy. Without the Convention, we deprive ourselves of very useful tools, routine and especially challenge inspections, to investigate our concerns about chemical weapons programs in Russia and elsewhere. Without the Convention, we deny the intelligence community a steady flow of information that it has stated would help sharpen its proliferation assessments.

The lack of U.S. participation in the Convention undercuts not only its long-term viability but other efforts to control dual-use technologies and materials. If this treaty flounders, the attempt to add meaningful verification provisions to the Biological and Toxin Weapons Convention will also probably fail.

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[1] See Exhibit No. 1b in the Appendix on page 445.

The Senate's inaction on the Convention also underscores the gap that is increasingly evident between U.S. rhetoric and U.S. action. America claims to be the leader of the post-Cold War world. This treaty outlaws a category of weapons that is universally abhorred. A decade ago, Congress mandated that the Army unilaterally destroy well over 95 percent of this stockpile. If the Senate cannot give its consent to ratify this treaty, just what kind of leadership can American citizens and the world expect of Washington?

These are just a few of the points identified by the report's authors, which include Senator John Glenn and also Mike Moodie, who is testifying here today. This report also comes with additional counsel from former Secretary of State Lawrence Eagleburger, former National Security Advisor Brent Scowcroft, and Senators Nancy Kassebaum, John Kerry, and Joe Biden, as well as the Chemical Manufacturers Association, among others, to get on with the business of ratifying this treaty.

Senator Lugar, I think you hit it right on the mark yesterday when you asked the question, why is the Senate not debating the Chemical Weapons Convention?

In conclusion, even though the specific problems of lax security at Russia's chemical weapons storage sites have preoccupied me of late, it is hard to ignore the overall problem of chemical weapons proliferation. At present, about 30 countries are believed to be harboring chemical weapons capabilities or stockpiles.

Senators in the absence of purposeful action to address these problems, U.S. soldiers are more likely to encounter chemical weapons on some foreign battlefield and chemical terrorism is more likely to migrate to America's shores.

Thank you for your attention. I look forward to your questions.

[The prepared statement of Ms. Smithson follows:]

PREPARED STATEMENT OF MS. SMITHSON

On March 20th, religious zealots in Japan broke a taboo against use of weapons of mass destruction by terrorists and, in the process, provided an ominous glimpse into future acts of terrorism. Contrary to most expectations and fears, the weapon of choice was not nuclear, but chemical. Twelve were killed and over 5,000 injured when the nerve gas sarin was released during the morning rush hour on Tokyo's crowded subway system.[1] Now that this line has been crossed, other terrorists and leaders of rogue states may try to follow in Aum Shinrikyo's path.

Moreover, U.S. policy makers need only recall the terrorists acts in New York City in 1991 and Oklahoma City in 1995 that stunned the whole world to face the ugly possibility that chemical terrorism could migrate to U.S. shores or even originate here. President Bill Clinton observed, "In light of what happened in Japan, all advanced countries should be very, very concerned about the prospect of the merger of terrorism with weapons of mass destruction."[2] For example, the effective use of chemical agents instead of conventional explosives in the 1991 terrorist attack against the World Trade Center would have totally devastated the building's occupants within a few moments.[3]

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[1] Nicholas D. Kristof, "Hundreds in Japan Hunt Gas Attackers After 8 Die: Police Tighten Security Steps at Stations," *New York Times*, 21 March 1995, A1; Lois Ember, "Tokyo Subway Attack: Chemical Weapon Possible Terrorist Tool," *Chemical & Engineering News* (27 March 1995): 6–7; "Gas Attacks Renew Fears For Japanese," *Washington Post*, 15 July 1995, A20.

[2] President William J. Clinton, Joint Press Conference by President Clinton and President Boris Yeltsin, Moscow, 10 May 1995.

[3] See Victor A. Utgoff, *The Challenge of Chemical Weapons: An American Perspective* (New York: St. Martin's Press, 1991), 241–2. See also, Anthony H. Cordesman, "One Half Cheer for

When the Soviet Union collapsed, much attention was given to the possibility that nuclear weapons or their components could find their way into the wrong hands. The frightening prospect of "loose nukes" prompted Senators Richard Lugar (R-Indiana) and Sam Nunn (D-Georgia) to launch a program to help Russia, Belarus, Ukraine, and Kazakhstan secure these weapons and begin safely dismantling their delivery vehicles according to treaty requirements. The Cooperative Threat Reduction (CTR) program got off to a slow start because umbrella agreements had to be negotiated with the former Soviet states and the Defense Department had to award contracts to U.S. companies to provide the appropriate goods and services.[4] However, there is widespread agreement that the CTR program has made impressive strides in improving the security of former Soviet nuclear weapons, facilitating the dismantlement of delivery vehicles, and providing assistance and opportunities to enable Russia's nuclear experts to apply their skills to peaceful uses, not to nuclear proliferators or terrorists.

Perhaps because U.S. policy makers have been so preoccupied with addressing the nuclear agenda, comparatively little thought has been given to chemical matters. However, it is prudent to examine the potential for theft and black marketeering of Russia's chemical weapons given Japan's horrifying encounter with chemical terrorism. Nerve agents, including VX, sarin, and soman, comprise over 80 percent of Russia's 40,000 metric ton chemical arsenal.[5] With regard to Russia's chemical weapons storage facilities, Russian Army Chief of Staff Gen. Mikhail Kolesnikov recently described the security measures at these facilities as "inadequate," pointing out that the chemical arsenal is "more vulnerable to theft" since the location of Russia's seven storage facilities has become a matter of public record.[6] This information was classified until mid-January 1994, when Rossiiskaya Gazeta published the amount and types of chemical agents stored at each site.[7] Russia's blister agents—mustard and lewisite—are stored at Gorny and Kambarka. The remaining sites are Kizner, Leonidovka, Maradykovsky, Pochep, and Schchuche. These sites store mostly nerve agents, such as VX, sarin, and soman.

Some of those who have been to Russia's chemical weapons storage facilities provide a disquieting picture regarding the security of the sites. The following paragraphs provide a general description of the security provisions that appear to be in place at four of the seven Russian storage sites.[8] While this description is based on first-hand accounts, some caveats must be attached to it. First, these eyewitnesses may not have noticed all of the security measures present. Second, Russian officials may have purposefully changed their practices while visitors were present or after they left to protect the integrity of their security measures. Third, Russian officials may have controlled the visit so that outsiders saw only partial views of the facilities. Fourth, the differences observed in security from one site to another may be attributed to one or more of these factors. Finally, these accounts may be biased toward Western security practices.

Security for chemical weapons has three basic components: physical barriers at a particular site, human controls/guards, and the system of accountability. Ideally, these components work together to block theft from outside or inside the facility. Physical barriers are items such as fences, locks, and other security devices in-

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the CWC: Putting the Chemical Weapons Convention in Military Perspective," in *Ratifying the Chemical Weapons Convention,* ed Brad Roberts (Washington, D.C.: Center for Strategic and International Studies, 1994), 44.

[4] Dunbar Lockwood, "Getting Down to Business," *Bulletin of the Atomic Scientists* 51, no. 1 (January/February 1995): 12–3. For more on the former Soviet nuclear arsenal and the evolution of the CTR program, see Zachary S. Davis and Jason D. Ellis, "Nuclear Proliferation: Problems in the States of the Former Soviet Union," CRS Issue Brief IB91129 (Washington, D.C.: Library of Congress, Congressional Research Service, 28 June 1995); Amy F. Woolf and Theodor W. Galdi.

[5] About 70 percent of the 32,500 metric tons of nerve agent in Russia's stockpile is in air-delivered munitions. Walter L. Busbee, "Now for the Heavy Lifting: Destroying CW Stockpiles in the United States and Russia," in *Ratifying the Chemical Weapons Convention,* 111.

[6] "Russian Security Inadequate for Chemical Weapons Storage," Agence France Presse, 2 August 1995.

[7] Igor Vlasov, "Chemical Splinters in Russia's Body," *Rossiskaya Gazeta,* 15 January 1994, 3.

[8] The author interviewed people who had visited one or more Russian facilities, asking them about security measures they did or did not observe. Those interviewed were at these facilities for varying periods of time, from hours to days. Several of these individuals, who had different affiliations, gave descriptions of specific sites. The author has elected to provide a general description, accompanied by examples, without identifying the particular sites involved. She would like to emphasize that no one who spoke with her revealed classified information. For a rare and brief public account of a U.S. inspection conducted under the Wyoming Memorandum of Understanding, see Joseph D. Richard, "Team Morris' Inspects Russia's Pochep Facility," *On-Site Insights* 6, no. 8 (September 1994): 4–5.

tended to deter an attack against a facility or impede the attackers until guards can respond. Guards at a facility control access to the compound, monitoring the perimeter and checking vehicle and pedestrian traffic to prevent unauthorized personnel from entering. If the physical security at a facility were to be breached, it is the responsibility of these troops to respond, engage, and fend off attackers. The system of accountability entails the procedures that a nation uses to keep track of chemical weapons in the inventory and the chemical agent in bulk storage at various sites.

PHYSICAL SECURITY AT RUSSIAN CHEMICAL WEAPONS STORAGE SITES

In general, outsiders who have been to Russian chemical weapons storage facilities characterize the security at these sites as similar to the measures commonplace at U.S. storage facilities in the 1950s. Since then, the United States has switched to an approach that employs significant physical barriers, intruder alarms, and other electronic sensors monitored from a central security control room.[9] In contrast, Russian chemical weapons storage facilities have the bare basics of physical security for a sensitive military site—multiple exterior fences, storage buildings, and padlocks.[10]

One of the storage sites visited was a stand-alone facility, but the others were inside or collocated with a larger military compound.[11] Normally, the chemical weapons storage area had different entrances for pedestrians, road vehicles, and railroad cars. At two sites, a two-gate entrapment system was used at the main entry. Guards were present at the main gates at all facilities.[12] Railroad entrances—padlocked double-opening fences were observed—did not appear to be guarded.[13] More than one individual observed that the railroad tracks into the restricted chemical storage area were rusted, with grass overgrowing the tracks, and did not look like they had been used in a long time.[14] At one facility that was adjacent to another compound, an unguarded gate in the fence separating the two areas could be seen.[15]

Different combinations of fences are used for perimeter security at Russian chemical weapon storage sites. Some fences were chain-link, some were barbed wire, and some were apparently electrified. Two concentric exterior fences were erected at some sites, three or four fence lines at others. Some fences were in good repair, others appeared to be poorly maintained. At one site where the storage facility was inside a larger compound, a wall, approximately eight feet high, had been erected around the chemical weapons storage area.[16] One interviewee described the outer fencing as "tall cattle fences."[17] The zone between the innermost and outermost fences was cleared and well-maintained at some sites, allowing for foot or vehicle patrols. In some cases, a clear zone was established outside the outermost fence and a worn path indicating perimeter patrols was evident. In other cases, the outermost fence was directly adjacent to a village or wooded area, and the direction of the observed paths indicated pedestrian traffic to and from a nearby village, not perimeter guard activities.[18] According to one individual, at one site "there had been clear zones," but this area was not well-maintained.[19] At two sites, perimeter lights along the fence line were seen, but the lights were few in number and did not appear to be well-maintained.[20] Perimeter lights were not observed at the other facilities.[21] No electronic security devices, such as closed-circuit or low-light TV cameras, were observed on or near the exterior fences.[22]

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[9] Interviews by author, 28 July 1995, 31 July 1995, and 11 August 1995.

[10] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995, 31 August 1995, 18 September 1995.

[11] Interviews by author, 28 July 1995, 31 July 1995, 31 August 1995, 18 September 1995. According to Representative Glen Browder (D-Alabama), family housing units were inside the larger military compound at one storage site, with children playing nearby the restricted chemical storage area. Interview with Congressman Glen Browder, Washington, D.C., 14 September 1995

[12] Interviews by author, 28 July 1995, 31 July 1995, 31 August 1995, 18 September 1995. At one of the entries to the restricted area at one site, the guard was inside a plexiglass booth and pedestrians had to pass through a turnstile. Interview by author, 21 August 1995. In a two-gate entrapment, entering vehicles are stopped between the outer and inner gates, while the guard checks identification prior to opening the inner gate.

[13] Interviews by author, 31 July 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[14] Interviews, 28 July 1995, 11 August 1995.

[15] Interview by author, 31 August 1995.

[16] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[17] Interview by author, 18 September 1995.

[18] Interviews by author, 11 August 1995, 21 August 1995, 31 August 1995.

[19] Interview by author, 18 September 1995.

[20] Interviews by author, 28 July 1995, 31 July 1995, 31 August 1995

[21] Interviews by author, 11 August 1995, 21 August 1995, 18 September 1995.

Some storage buildings were constructed with cement blocks and had wooden or steel-faced doors.[23] Others were made only of wood and had wooden doors and windows with bars. The roofs of these buildings were often made of tile or wood. At one site, holes could be seen in the roof, but at other sites, the buildings were well-maintained. The buildings at one facility had just been reroofed.[24] Several people interviewed observed nothing other than a single-key padlock on the doors to storage buildings.[25] At one sight, the doors to storage buildings had an additional bar across the door required a separate device or key to unlock, but the lower section of these doors had unsecured lift-up "dog doors" used for first-entry monitoring. Given the "material of construction and the kinds of locks they used, it was nothing that a locksmith couldn't defeat," said one interviewee.[26] Intruder detection devices—probably a circuit-breaker mechanisms—were observed on the doors to individual storage buildings at second site and possibly at a third.[27] No one recalled electronic or other intruder detection sensors on the other openings to these buildings (e.g., windows).[28]

Inside these buildings, munitions were kept in racks, similar to the storage of wine bottles, or stacked horizontally on wooden pallets. Bulk storage drums were elevated on beams to facilitate monitoring for corrosion or a clean-up effort in the event of a leak.[29] Smaller items, like munitions and storage drums were numbered, most likely with production lot, not serial, numbers.[30] Missile warheads also appeared to be marked with production lot numbers. Each warhead had its own numbered storage container.[31] At one site, caged birds were kept inside the cement storage buildings—a time-tested method of detecting whether chemical agent is present. The death of the bird is a likely indicator of a leaking weapon or container.[32]

The munitions and bulk storage containers observed were well-maintained, in good to excellent condition.[33] As Congressman Glen Browder (D-Alabama) reported after a visiting a Russian storage site in 1994, "The chemical shells and warheads which we inspected appeared to be in good condition, having been manufactured between the early 1950s and mid-1980s, and were battlefield-ready."[34]

Interviewees did not observe physical barriers, such as an large obstacle that would have to be moved, in front of storage building doors. Nor were tamper detection seals seen on any storage building doors.[35] Seals were used sporadically at some sites, apparently not at all at others. For example, the large 50-cubic meter storage tanks and storage drums were scaled at one site, but at another, these large storage tanks apparently were not sealed. The containers for missile warheads were sealed at one site, but the other items there were not sealed. The seals that were observed were wire-loop or lead seals that were dated and numbered. Ostensibly, either the seal has to be broken or the wire cut to open them.[36]

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[22] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995, 21 August 1995, 18 September 1995. Browder did not observe any electronic surveillance or intruder detection equipment at one site. Interview with Browder, 14 September 1995.

[23] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 31 August 1995, 18 September 1995. Some of the cement block buildings at one site had large openings, approximately 6 feet by 6 feet, that were covered by a wire mesh grill. Interview by author, 28 July 1995.

[24] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 31 August 1995, 18 September 1995.

[25] Interviews by author, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995.

[26] Interview by author, 18 September 1995.

[27] Interview by author, 28 July 1995. At one site, an individual saw what might have been a roller or switch on the door, but could not be certain that that was the case. The accompanying soldier did telephone someone before unlocking the door to enter the building. Interview by author, 31 August 1995.

[28] Browder did not observe any electronic surveillance or intruder detection equipment at one site. Interview with Browder, 14 September 1995. Nor did others observe such devices on storage doors or within buildings. Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995, 18 September 1995.

[29] Interviews by author, 31 July 1995, 11 August 1995, 21 August 1995, 18 September 1995.

[30] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 31 August 1995, 18 September 1995.

[31] Interviews by author, 31 August 1995, 18 September 1995.

[32] Interview by author, 31 July 1995.

[33] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[34] Rep. Glen Browder, Memorandum to Representative Ronald V. Dellums, Chairman, House Armed Services Committee, "July 3–10 Codel to Concerning Chemical Weapons," 25 July 1994.

[35] Interviews by author, 31 July 1995, 11 August 1995, 31 August 1995, 18 September 1995.

GUARDS AND ACCOUNTABILITY AT RUSSIAN CHEMICAL WEAPONS STORAGE SITES

Physical security aside, more than one individual interviewed dwelled on the human component of security at Russia's chemical weapons storage facilities. As noted, main gates were guarded and the identification of visitors was checked before they were allowed to enter. Visitors were issued badges.[37] Armed perimeter patrols were seen at some sites, but not at others. Guards were not stationed at individual storage buildings at the time that visitors were there. The troops encountered were courteous and well-disciplined. Morale was good; these soldiers did not appear to be discontent.[38] One individual observed that there were "No signs of things falling apart around the seams," but another noted that one site was poorly maintained.[39] Soldiers had expressed concerns about "bandits" in the area, recalled one interviewee.[40]

Following Soviet precedent for tracking the whereabouts of weapons, the soldiers at these facilities use a "personalized" system of accountability. Officers are personally responsible for the chemical weapons stored within a given number of buildings, usually one to five buildings. With smaller items such as artillery shells, this means that a single officer can be responsible for hundreds of weapons. If something is missing, this officer is held accountable. Written records are kept, and the location of munitions or drums is noted on a planograph or a diagram of the building's contents. A computer database, however, is not used.[41]

At some sites, soldiers stated that they entered storage buildings frequently, even on a daily basis, for maintenance and inventory activities.[42] Such statements could not, of course, be confirmed. However some individuals witnessed inventory and maintenance procedures. For example, racks of munitions, stacked from the floor to the ceiling, were painstakingly inventoried, as were rows of storage drums. Results were recorded on the aforementioned planograph.[43] Soldiers used a 15-foot long dipstick to measure the level of agent in the 50-cubic meter storage tanks. They also conducted an analysis of the contents to ascertain the concentration of key chemicals. To prevent the rupture of storage drums, it is standard Russian procedure to open these drums periodically to relieve the gas pressure that builds up inside. Storage drums, tanks, and munitions were checked for signs of disrepair or corrosion.[44]

EVALUATING THE SECURITY OF RUSSIA'S CHEMICAL ARSENAL

In some respects, the security measures described above do not appear to be too far out of order. Thieves cannot just walk off with a 50-cubic meter tank full of chemical agent.[45] Racks of artillery shells are placed so close together that it would be difficult to maneuver lifting equipment inside the building to cart off several racks of artillery shells.[46] Some storage sites are a restricted area inside of a larger military compound, which would make it more difficult to violate security. In other words, the way that Russian chemical weapons and bulk agent are stored creates some built-in security features.

In other instances, this account raises some grave concerns, especially for those who are familiar with routine security procedures at sensitive U.S. military sites. By U.S. standards, Russian chemical weapon storage facilities unquestionably appear to be vulnerable to attack from outside and theft from within. In the discussion that follows, apparent shortfalls are identified and possible scenarios for foul play are raised. General U.S. standards of physical security and accountability practices are presented as a point of comparison.

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[36] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 18 September 1995.

[37] Interviews by author, 31 July 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[38] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995. At one site, the enlisted soldiers were "run-of-the-mill," not the type of soldier that would be assigned to guard sensitive military facilities in the West. The officers were "clearly disgruntled at having to open the facility" to outsiders. Interview by author, 18 September 1995. In contrast, Browder noted that inside the chemical weapons storage section, his hosts were quite open to having him look around the site. Browder, interview by author, 14 September 1995.

[39] The first comment was made in an 11 August 1995 interview; the second in a 18 September 1995 interview.

[40] Interview by author, 31 August 1995.

[41] Interviews by author, 30 August 1995, 31 August 1995.

[42] Interviews by author, 31 July 1995, 30 August 1995.

[43] Interviews by author, 31 July 1995, 31 August 1995.

[44] Interviews by author, 31 July 1995, 11 August 1995.

[45] Interview by author, 11 August 1995.

[46] Interview by author, 21 August 1995.

Shortcomings in the physical security were readily apparent at the Russian storage facilities visited. For example, perimeter fences lacked electronic sensors and intrusion detection devices. In the absence of well-maintained clear zones and perimeter lighting, attackers have more cover for a stealthy approach. Railroad entrances at these facilities could be a particularly egregious breach of perimeter security, since they were apparently unguarded and secured only with a single-key padlock.[47] Single-key padlocks were frequently the only visible barrier to entrance at individual storage buildings. Additional physical barriers were not seen. In the majority of cases, intrusion detection devices apparently were not installed.[48] A lone padlock on any door, especially a wooden door, is hardly an impediment to thieves or attackers. At the one site where storage tanks and drums were sealed, the technology used was not tamper-proof.[49]

These measures fall far short of the physical security at U.S. chemical weapons storage sites. For example, two continuous lines of intrusion detection sensors, as well as imaging systems (e.g., closed-circuit TV, radar, and infrared detectors), buttress perimeter fencing, lighting, and clear zones. Where appropriate, vehicle barriers such as concrete blocks, ditches, and posts embedded in the ground are situated to prevent vehicles from crashing gates or fences. In addition, huge concrete blocks are placed immediately in front of the entrance of U.S. bulk storage buildings, which are built of concrete and sometimes also bermed. These so-called "King Tut" blocks are so heavy that a forklift must remove them to enable access. U.S. regulations require that two soldiers be present to open a storage building. Each has possession of a separate key to unlock one of the two high-security padlocks on the door. When entry occurs, at least one other soldier will be alerted. Balanced magnetic switches or other intrusion detection sensors are placed on all doors, windows, and movable openings of U.S. storage buildings. These sensors, which are tamper-protected, automatically notify the security control center, which is manned 24 hours a day, of intrusions of perimeter and individual building security.[50] Table 1 compares the security measures generally practiced at U.S. storage sites with the physical security observed at some Russian storage sites.

Of the physical security at Russian chemical weapons storage sites, one interviewee characterized it as suitable "to keep an honest man out," another as "rudimentary."[51] A much harsher assessment was offered by another individual, who concluded, "You could really walk into that place without any problem."[52] Browder observed that "Their facilities were not as secure as ours, especially regarding physical security."[53] Yet another person acknowledged the shortcomings in physical security, but thought that Russia's chemical weapons are probably "secure as long as the people who are guarding them want them to be safe."[54] This statement brings up a different set of concerns related to the Russian system of accountability and potential problems among Russian troops and chemical weapons experts.

A fair amount of Russia's chemical agent is in bulk storage containers. One is not counting munitions as much as tons of agent. While measurements from large storage tanks provide a rough idea of how much agent is there, these circumstances could present an accountability problem.[55] Chemical agents are not stable and tend to deteriorate gradually. Unless the seals on these tanks are tamper-proof and daily measurements, both of quantity and quality, are taken and cross-checked by individuals that are not within the immediate chain of accountability, it would be difficult in the event of a discrepancy to tell whether chemical agent leaked or was stolen. In other words, there did not appear to be significant obstacles to prevent someone from systematically skimming small quantities of agent out of bulk storage containers.[56]

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[47] Interviews by author, 21 August 1995, 30 August 1995, 31 August 1995.

[48] Interviews by author, 11 August 1995, 21 August 1995, 31 August 1995.

[49] To foil these wire loop or lead seals without detection, the thief would need to replicate the seal that leaves an imprint on the lead. This type of sealing technology was common in the 1970s. Fiber-optic, tamper-proof seals can now be readily obtained. Interview by author, 28 July 1995. Another person noted that the Russians also use a "primitive" string and clay pot seal at nuclear facilities, which can be spoofed by un-threading the string to gain access and then rethreading the string through the clay in the pot. As noted, much more advanced seal technology is available. Interview by author, 30 August 1995.

[50] *Military Police: Chemical Agent Security Program,* Army Regulation 190–59 (Washington, D.C.: Department of the Army, 27 June 1994), 6–11, 16–17, 37. Interviews by author, 11 August 1995, 21 August 1995, 31 August 1995. Other documents that stipulate the security and safety practices followed at U.S. chemical weapons storage sites include *Chemical Surety,* Army Regulation 50–6 (Washington, D.C.: Department of the Army, 12 November 1986); *Safely: Toxic Chemical Agent Safety Standards,* Pamphlet 385–61 (Washington, D.C.: Department of the Army, currently being revised); *Medical Services: Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard Agents H, HD, and HT,* Pamphlet 40–173 (Washington, D.C.: Department of the Army, 30 August 1991); *Medical Services: Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX* (Washington, D.C.: Department of the Army, 4 December 1990).

[51] Interview by author, 11 August 1995, 18 September 1995.

[52] Interview by author, 21 August 1995.

[53] Interview with Browder, 14 September 1995.

[54] Interview by author, 28 July 1995.

Moreover, the soldiers, not the officer accountable, are apparently conducting the inventory and maintenance chores. Therefore, another possibility is that with so many munitions, a number of artillery rounds could disappear before the officer in charge might notice.[57] What is not known at this point is what procedures, if any, the Russian military has for cross-checking these records. If inventory records are not routinely and randomly cross-checked by others outside the immediate unit and facility where accountability in the Russian system apparently rests, it would not be a great challenge for one or more soldiers to falsify these records. In short, theft appears to be possible if Ivan, the individual soldier, is so inclined; if a colleague and Ivan conspire; or if an outsider coopts or disables Ivan.

In contrast, accountability at U.S. storage facilities is institutionalized, collective, and computerized. U.S. storage igloos and bunkers are infrequently opened for random inventory and maintenance activities. When a soldier engages in maintenance chores or takes an inventory count, his work is double-checked and cross-checked by others to ensure its accuracy. A written planograph and computerized records are updated accordingly. These records account for the number and type of munitions in each bunker and at each storage facility. Munitions are tracked by serial number and/or production lot number. Officials at a central record keeping unit in Rock Island, Illinois, also review this data. The commanding officer here is the individual accountable for the U.S. chemical weapons inventory. Units from this central command are randomly sent to the eight storage depots in the United States to check the accuracy of these records.[58]

In all fairness, U.S. security and accountability at U.S. chemical storage facilities are not perfect. Furthermore, U.S. newspapers often describe breaches in security or acts of vandalism at U.S. regular military bases. Problems also occur with the reliability of the military personnel at sensitive U.S. facilities. The armed services do no publicize such incidents because they are embarrassing and detract from public confidence in the safety of the military bases in their midst. At U.S. chemical weapons storage sites, disgruntled soldiers—"the Timothy McVeighs of this world," as one interviewee put it—could be among the personnel. However, because of the redundancies in the U.S. physical security and in the system of accountability, a malcontent would have to recruit others in different units in order to defeat the physical security and the system of accountability. The odds of an insider successfully stealing chemical agent or munitions from a U.S. facility without being caught somewhere along the way are quite low.[59]

One must also understand that the redundancy and technical sophistication that gird the physical security and accountability at U.S. chemical weapons storage sites did not appear overnight. For instance, U.S. recordkeeping has been computerized to some extent for a long time and has gradually improved to make the records more specific. Also, it was not that long ago that rabbits were kept in U.S. storage bunkers to indicate whether the munitions within had leaked. What may be viewed as old-fashioned methods are nonetheless proven and work well.

Some of the fundamental differences in apparent Russian and U.S. security provisions are due to the nature of the respective Russian and American chemical weapons stockpiles. For instance, many U.S. chemical weapons such as the M–55 rocket are "full-up," with the explosives and propellents inside the munition. U.S. storage buildings are therefore built to withstand an explosion of high explosives and to contain the chemical agent. The explosives and propellents for Russian chemical weapons are reportedly stored apart from the part of the munition that contains the chemical agent. Since there is less inherent danger for an explosion within a Russian chemical weapons storage building, there is not a pressing safety requirement for especially sturdy storage buildings.

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[55] Interview by author, 8 August 1995.

[56] Interviews by author, 28 July 1995, 30 July 1995.

[57] Interviews by author, 21 August 1995, 30 August 1995, 31 August 1995.

[58] Interviews by author, 7 September 1995, 30 August 1995, and 31 August 1995. The arsenal at a ninth U.S. facility, on Johnston Island in the Pacific Ocean, is currently being destroyed. The one-ton bulk storage tanks present at some U.S. facilities are sealed and occasionally weighed to ascertain whether any agent is missing.

[59] Interview by author, 30 August 1995. Note that there have been numerous threats of terrorist use of chemical weapons, including one instance in 1975 where 53 canisters of the blister agent mustard were stolen from a U.S. chemical weapons storage facility in West Germany. The terrorists, probably associated with the Baader-Meinhof gang, did not carry out their threat and some, but not all of the stolen agent was recovered. In another example, a neo-Nazi skinhead group had plans in 1992 to kill children in a Dallas Jewish day-care center using cyanide. For a listing of reported threats, possession, and use of chemical agents for terrorist purposes, see Ron Purver, *Chemical and Biological Terrorism: The Threat According to the Open Literature* (Toronto: Canadian Security Intelligence Service, June 1995), 82, 84–5. See also Robin Wright, "Many Nations Seen Vulnerable to Poison Use," *Los Angeles Times*, 21 March 1995, 1.

As for some of the noticeable disparities related to accountability, the current Russian system is manpower-intensive largely because the Soviet Union could command significant human resources for a task. The officers in charge of Russia's chemical facilities are simply following precedent. The U.S. approach to accountability grew out of necessity. U.S. bunkers are tightly secured and not entered as frequently because as the U.S. stockpile aged, more leaks occurred.[60] In other words, the United States battened down the hatches and switched to a system of quarterly storage monitoring inspections and random checks initially for personnel and public safety reasons.

However, with a personalized system of accountability and minimal physical barriers, there appear to be some gaps in security at Russian facilities. Moreover, as one interviewee pointed out, the storage sites are a long way from Moscow and the borders of the former Soviet Union are becoming increasingly porous. "Sooner or later, someone will make [the soldiers at these sites] a better offer than Moscow does. If something was missing, it is likely to be an inside job."[61] With Russia's ailing economy and the limited resources now available to the Russian armed forces, the potential thus exists for insider theft and black marketeering for personal economic gain.[62] Wayward political affiliations could also be the motivating factor behind an inside theft from a Russian chemical weapons facility.

If such an incident were to occur, another concern raised was the preparedness of Russian authorities to respond. Do local military units and national authorities routinely assess the security vulnerabilities of these facilities? Do they have recovery plans and the equipment to execute them? Do they conduct training exercises to practice the recovery of chemical weapons? How quickly can Russian authorities mobilize to respond?[63] At this point, the answers to such questions are not known.

Some might ask why anyone would bother to steal Russian chemical weapons when chemical agents are not that difficult to make, compared to a nuclear device. The ingredients and equipment are commercially available, and the formulas for many chemical agents are common scientific knowledge.[64] Of course, it has always been difficult to predict what disturbed workers, rebels, or terrorists will do, but those who want to inflict the most serious harm may seek military-strength chemical agent. Terrorists may be able to concoct a chemical agent, but it as not as easy as some might believe to make highly effective chemical agent. For instance, evidence indicates Aum Shinrikyo's chemists were unsuccessful in their attempts to manufacture high-grade sarin.[65] Their failure ultimately saved the lives of thousands who were in the Tokyo subway last March 20th.

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[60] From 1983 to 1994, there were 1,862 leaks within the U.S. stockpile. U.S. Army Chemical Demilitarization and Remediation Activity, *Annual Status Report on the Disposal of Lethal Chemical Weapons and Materiel* (Department of the Army, 15 December 1994), 37.

[61] Interview by author, 28 July 1995.

[62] During a report on French television showing an image of Saratov, a reporter intoned, "You can get in here almost at will. But it ought to be one of the best guarded places in Russia, one of the six or seven storage centers for thousands of tonnes of toxic gas formerly produced by the Soviet Union. . . . Everything leads one to believe that the least self-respecting terrorist would have no difficulty in hold of a few liters. Here everything is for sale and everything can be bought." "Official On Availability of Chemical Weapons in Russia," France–2 Television Network, 21 March 1995, FBIS Translation. Saratov is actually a military academy, where training of Russia's chemical troops occurs, not one of Russia's chemical weapons storage facilities. The equivalent in the United States is Ft. McClellan in Alabama.

[63] Interview by author, 31 August 1995. In a related readiness issue, Browder noted that the preparedness of Russian soldiers to respond to an accident or incident with chemical weapons appeared to be meager. Interview with Browder, 14 September 1995. Noting that the fire-fighting equipment within the restricted area consisted of axes, sand-filled buckets, and buckets for bailing water, another interviewee described their "ability to respond to fire or security threats was marginal to nonexistent." Interview by author, 18 September 1995. All U.S. storage facilities conduct routine vulnerability assessments and have plans and drills to practice a response to locate and recover stolen munitions. *Chemical Agent Security Program,* 22, 31–2.

[64] Many of the same chemicals that can be used to produce pharmaceuticals, textile dyes, and pesticides can also be used to make chemical agents. For this reason, the Chemical Weapons Convention contains unprecedented verification provisions that control such "precursor" chemicals and require reporting and inspection within commercial chemical industry. While such procedures will help international inspectors track and assess commercial activities with dual-use chemicals, the ingredients, equipment, and know-how to make chemical weapons will be on the open market indefinitely.

Another factor to consider is that chemical weapons are easier to use than nuclear weapons. With chemical weapons, thieves do not have to overcome the security devices or Permissive Action Links (PALS) that are often placed on individual nuclear weapons. Nor do they have to figure out the launch codes and sequences that are likely to frustrate an attempt to use a stolen nuclear weapon. Instead, the would-be users of chemical weapons purchased on the black market or stolen from a facility can shield themselves with protective clothing and gas masks that are commercially available. If they have artillery guns or aircraft, they have the option to use chemical munitions as is or to drain them and fashion their own crude delivery system.[66] "Once stolen, a chemical weapon is far easier for a terrorist or rebel military group to use than a nuclear weapon."[67] Moreover, the use of poison gas is not perceived as being as heinous as the use of nuclear weapons.[68]

When asked to assess the threat of Russian nuclear weapons being stolen versus the possibility of Russian chemical weapons theft, one interviewee viewed the threat as "very much the same."[69] Others interviewed differed with this opinion. They believed that Russia's chemical arsenal presents a far more exposed and appealing target for potential thieves or attackers.[70]

Although security apparently varies from facility to facility, security at Russian nuclear facilities was described as generally better than the security observed at Russian chemical weapons storage sites. Russian nuclear facilities have redundant perimeter fences; steel doors on storage buildings; electronic sensors; and serial numbers, seals, and PALs on warheads, which have accompanying containers that each have their own "passport" control documents. Using a 1 to 10 scale, with 10 being the highest grade of security, one interviewee rated U.S. nuclear security a 9.9, Russian nuclear security an 8, U.S. chemical weapons security a 9+, and Russian chemical weapons security a 3.[71] From another individual, the security of Russian chemical weapons also received a rating of 3, while security at U.S. storage sites was rated from 8 to 10, depending upon the facility.[72]

Finally, U.S. policy makers should also be cognizant of the gradual disintegration that has taken place throughout Russia's complex of research, production, and storage facilities. The effects of economic hardship show not only in the apparent differences in physical security and maintenance observed from one storage facility to another. Hundreds of chemical weapons experts are out of work. With less and less cohesion among this research community, the temptation for these experts to sell their knowledge to the highest bidder will increase if they cannot find more productive and peaceful ways to support themselves and their families. Unlike nuclear development programs, where a relatively small number of people know all of the crucial information about making a nuclear weapon, the knowledge threshold for chemical weapons is not nearly as high. A larger number of Russian chemical weapons specialists know enough to benefit greatly the efforts of would-be chemical weapons proliferators.[73]

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[65] Interview with Kyle Olson, Washington, D.C., 14 September 1995. Olson is writing a book about the recent events in Japan.

[66] The Aum Shinrikyo cult executed its attack on Tokyo's subway by placing low-grade sarin in two-ply plastic bags and using umbrellas or other sharp objects to puncture these bags quickly before exiting the subway cars. Unsuspecting passengers left on those cars were quickly overcome with fumes, which also made their way into the subway stations when the effected trains stopped to release passengers. Interview with Olson, 14 September 1995. Olson also observed that Russian chemical weapons are comparatively safe to transport since the high-explosive component reportedly is stored separately from the chemical munition.

[67] Interview by author, 30 August 1995.

[68] Throughout history, warring parties have resorted to chemical weapons more frequently than nuclear weapons, which the United States used twice against Japan at the end of World War II. Chemical weapons were a hallmark of World War I and the 1980s Iran-Iraq War. China and Abyssinia also suffered chemical attacks during World War II. For more on the history of chemical weapons use, see Edward M. Spiers, *Chemical Weaponry: A Continuing Challenge* (New York: St. Martin's Press, 1989).

[69] Interview by author, 28 July 1995.

[70] Interviews by author, 30 August 1995 and 31 August 1995.

[71] This individual had been to numerous Russian nuclear facilities and had in-depth knowledge of Russian chemical weapons storage facilities. Interview by author, 30 August 1995.

[72] Interview by author, 18 September 1995.

[73] Interview by author, 8 August 1995. For more on the different technology thresholds underlying nuclear and chemical weapons, see U.S. Congress, Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction* (Washington, D.C.: U.S. Government Printing Office, December 1993). On chemical weapons proliferation, see U.S. Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction* (Washington, D.C.: U.S. Government Printing Office, December 1993); Gordon M. Burck and Charles C. Flowerree, *Inter-*

OBSERVATIONS AND RECOMMENDATIONS

From outward appearances, Russia's chemical weapons storage sites appear to be vulnerable—to theft from within and attack from without. In all candor, many American homes have more sophisticated physical security than was observed at some Russian chemical weapons storage sites. For about $200, sometimes less, U.S. citizens can have motion sensors, door and window contacts, and alarms installed and monitored 24 hours a day for an additional $22 monthly fee. Alarms bring private security or local police to the scene.[74]

Failure to improve the security at Russian chemical weapons storage facilities increases the odds that chemical agent of Russian origin will find its way onto the black market and into an ethnic conflict, subway system, or building somewhere. Innocent civilians will suffer the repercussions.

Again, the Russian government appears to have recognized the security at these sites as an issue in need of attention. Col. Gen. Stanislav Petrov, the commander of the Radiation, Chemical, and Biological Defense Troops, has requested additional funding to upgrade security at Russia's chemical weapons storage facilities since the locations have become a matter of public knowledge. Worried that this disclosure might fuel the worsening crime situation in Russia, Petrov noted that his already strained budget has been stretched even further by a Ministry of Defense effort to increase guard duty, upgrade the effectiveness of "engineering protection, and carry out vigilance exercises" at chemical weapons storage sites.[75] With few rubles available, the Kremlin must balance requests for improved security against domestic concerns about the environmental safety of Russia's chemical weapons stockpile, especially the blister agents at Gorny and Kambarka, and proposals to upgrade safety at chemical sites at an estimated cost of 21.6 billion rubles.[76] If environmental concerns are not addressed, it may be more difficult for the Russian government to persuade local communities to cooperate with the program to destroy the Russian chemical arsenal. For a government being pressed to keep its treaty commitments to eliminate its chemical stockpile, the choice is a difficult one.

While the CTR program was initiated to address the safety and security of all weapons of mass destruction in the former Soviet Union, the overwhelming majority of the Nunn-Lugar funds have gone toward nuclear security and disarmament. This focus on nuclear safety, security, and dismantlement was appropriately geared to the problems recognized at the time. To date, $55 million or roughly five percent of the over $1 billion in CTR funds has gone toward assisting the chemical weapons destruction program in Russia.

For a rather modest amount, the United States could help Russia markedly enhance security at these sites. Perimeter security could be strengthened to allow guards to detect and respond to intruders more rapidly. Lights and closed-circuit TV could be added. Physical security at individual buildings could be reinforced with better doors, locks, and King Tut blocks. More advanced seals would also appear to be in order. Such low-tech improvements will be less expensive and easier for the Russians to operate and maintain.

The United States might also consider providing early warning monitors or intruder detection—systems for heightened perimeter and storage building security. Another option would be to furnish computers so central inventory records could be maintained in a computerized database. To address the problem of "brain drain" of Russia's chemical weapons expertise, the United States might set up employment and aide projects under the umbrella of the CTR program, similar to those set up for Russia's nuclear experts.

In addition, U.S. officials might also constructively engage Russian authorities in a dialogue about response and recovery procedures to be used in the event of an attack or theft of chemical weapons. The U.S. Army routinely conducts vulnerability assessments of U.S. storage facilities. Response plans are tailored to each site and troops train and practice drills to test them and ensure readiness in the event of

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national Handbook on Chemical Weapons Proliferation (New York: Federation of American Scientists and Greenwood Press, 1991), U.S. House of Representatives, Committee on Armed Services, *Countering the Chemical and Biological Weapons Threat in the Post-Soviet World,* 102d Cong., 2d sess., Committee Print No. 15 (Washington, D.C.: U.S. Government Printing Office, 1993).

[74] This information reflects prices and services quoted by two home security companies, ADT and Brinks, on 30 August 1995. More elaborate systems are available.

[75] Ahatoliy Yurkin, "General Urges More Funds for Guarding Chemical Weapons," ITAR-TASS, 2 August 1995, FBIS Translation.

[76] "Over R509 Billion Needed to Destroy Chemical Weapons," *Novosti*, Moscow, 1 August 1995, FBIS Translation

an actual theft or attack.[77] Such capabilities and experience would be well worth sharing with Russian authorities.

In the midst of a struggle to bring federal spending under control, Congress correctly has its sights focused on improving government services to U.S. citizens at the lowest practicable cost. Such an intense focus on domestic matters can often result, however, in proposals that win points with the voters but in the end weaken U.S. national security. For example, some in Congress have called for cuts in the CTR program as a whole.[78] Others in Congress have proposed reducing funds for assistance to Russia's chemical weapons destruction program or have sought to portray certain CTR programs, such as those geared toward conversion of defense facilities, as ill-conceived. Such proposals are short-sighted.

The CTR program is an astute investment in U.S. and international security. U.S. security interests are being well served by aiding the security and dismantlement of former Soviet nuclear weapons, and funds should not be diverted from the important tasks that the CTR has underway in order to attend to security at Russian chemical weapons storage facilities.

The measures recommended above could yield substantial improvements in the security of Russia's chemical weapons stockpile, and exorbitant sums would not be required to enact them. Given the line crossed by Aum Shirtkyo and the political and economic circumstances in the former Soviet Union, the U.S. Senate would be prudent to set aside additional funds for assistance to reinforce security at these sites. The price of assisting Russia now is much lower than the cost that may be incurred later if this problem is not promptly addressed.

Senator NUNN. Thank you very much, Ms. Smithson.

Our next witness will be Dr. Vil Mirzayanov, Former Chief of Counterintelligence Department, State Research Institute of Organic Chemistry and Technology in Russia. Dr. Mirzayanov has been an outspoken critic of the continuing Russian chemical weapons program. Dr. Mirzayanov will give us his firsthand account of the Russian program and any of his other concerns he might like to share with us.

Dr. Mirzayanov, we are glad to have you this morning. I believe you are going to be giving your opening statement in English, as I understand it, and then you will for questions need the interpreter, is that correct?

Dr. MIRZAYANOV. Yes.

Senator NUNN. Anytime you need the interpreter, raise your hand. If we are going too fast, raise your hand. We want you to not only understand clearly the questions we ask but also understand the dialogue here at the table, so let us know if we are going too rapidly because I certainly would like an interchange between the various people testifying, if you have comments on the other persons' testimony.

You may proceed.

TESTIMONY OF DR. VIL S. MIRZAYANOV, FORMER CHIEF, COUNTERINTELLIGENCE DEPARTMENT, STATE RESEARCH INSTITUTE OF ORGANIC CHEMISTRY AND TECHNOLOGY, MOSCOW, RUSSIA

Dr. MIRZAYANOV. Respected ladies and gentlemen and honorable Senators, I have the honor of testifying in front of you because of my personal experience, knowledge in my 26 years of work in the State Research Institute of Organic Chemistry and Technology, GosNIIOKhT, which is the main developer of chemical weapons in

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[77] *Military Police Chemical Agent Security Program,* Army Regulation 190-59, 22, 25, 31–3

[78] For fiscal year 1996, the Clinton administration requested $731 million for the CTR program. The House of Representatives cut this request by $171 million, the Senate by $6 million. As of this writing, House and Senate conferees had not arrived at a final decision about CTR funding.

Russia. I worked there in the capacity of the senior lead scientific researcher, chief of the department in charge of protection against foreign technical intelligence, up until I was dismissed from my work in January of 1992.

Over my many long years at GosNIIOKhT, I became conscious of my own involvement in criminal work on the development and production of weapons of mass destruction. This feeling became intolerable for me around the beginning of the perestroika period, when the announcement was made that all problems would be solved by the peace and disarmament process and by the democratization of Russia.

Nonetheless, these claims were contradicted by reality, especially at my institute. It seemed that for the top level of the military-chemical complex, times had not changed. On the contrary, work on the development and testing of new chemical weapons intensified, becoming more goal-oriented.

That was the reason why I published an article on October 10, 1991, in *Kuranty* about the two-faced policy of the leadership of the military-chemical complex. Their programs to produce chemical weapons went against the bilateral agreement negotiated between the United States and the USSR about stopping the development, production, and testing of chemical weapons, even though that treaty was not yet activated.

Events of that time connected with the collapse of the USSR overshadowed my allegations. Despite additional attempts to bring these problems to the attention of the Russian politicians, for a long time, my revelations did not become the substance of discussion in either Russia or the West. This changed after I published a second article with coauthor Lev Fedorov in the daily *Moscow News* on September 16, 1992.

This time, there was an immediate reaction from the KGB. On October 22, 1992, a month after publication and after giving an interview to the *Baltimore Sun,* my apartment was searched and I was arrested and sent to the notorious Lefortovo Prison. I was accused of divulging state secrets, on the basis of secret lists which were never published. I was freed from jail pending trial but remained under house arrest during the period of investigation, which lasted more than a year and a half.

An expert commission was established, consisting largely of representatives from the military-chemical complex. They confirmed that the information contained in my article regarding the creation and testing of new systems of chemical weapons, including binary weapons, was accurate. The information was not technical and could not be classified. Nevertheless, a deputy from the Procurator General's office in Russia, which is equivalent to your Attorney General's office, signed an accusation and a trial followed.

Since the court refused to admit the unlawfulness of the charges which were based on classified lists of secrets that violated the Russian Constitution, I refused to participate in my own trial in order not to become an accessory to the crime of violating the constitution. I was arrested again, sent to a maximum security prison and held there for 26 days along with common criminals.

The mounting pressure of world public opinion, expressed by science and political leaders, caused the Procurator to overturn the charges. The trial was stopped. I was found not guilty because of lack of evidence and I was released from prison in February 1994.

My concerns are reflected in detail in my article, “Dismantling the Soviet-Russian Chemical Weapons Complex: An Insider’s View”, which the Stimson Center published in October 1995 in a report titled “Chemical Weapons Disarmament in Russia: Problems and Prospects”. I am not going to dwell on these concerns in detail.

However, we should all be aware of existing loopholes that might permit wrongdoing. If I am not mistaken, regulations that prohibit the export of potentially dangerous chemical compounds from Russia currently do not include the new chemical agents developed at GosNIIOKhT and their precursors. This could, of course, create some opportunities for the misuse of these chemicals.

A further confirmation of this danger is that General Anatoly Kuntsevich and his people are currently under investigation by the KGB for theft of chemical weapons in 1993 and attempted theft in 1994. It is important to stress that General Kuntsevich and his people are not brave enough to act on their own without their bosses’ consent.

A good cover for any efforts to proliferate chemical weapons could have been a 1992 agreement between the governments of Russia and Syria on the creation of a pan-Arabic ecological center that was supposed to be dealing with not only ecological problems but also with the problems of protection against chemical weapons. Kuntsevich became the executive administrator of this program from the Russian side, organizing experiments in GosNIIOKhT with the participation of Director Viktor Petrunin and Professor Georgi Drozd.

According to Drozd, his laboratory synthesized the standard samples of the chemical agents, registering their physical and chemical characteristics, et cetera. Several airplanes with cargo were sent to the aforementioned center in Syria. The investigation initiated by the KGB after the complaint of the deputy director of GosNIIOKhT, Viktor Polyakov, ended in the dismissal of General Kuntsevich, who was then chairman of the presidential committee that is supposed to oversee chemical weapons disarmament in Russia.

My concern here is not about the amount of stolen or intended dichloranhydride of methylphosphonic acid, even though this chemical is a precursor for the synthesis of soman, sarin, Substance 33, Substance A–230, and other chemical agents. Even if several tons of this chemical precursor were sent to Syria, this amount would not be enough to organize the production of weapons, though it could be enough to begin scientific research for the development and testing of new poisonous agents. My understanding is that Syria does not have its own scientists working in the field of chemical weapons. Therefore, I naturally concluded that Russian specialists were supposed to work with this precursor.

This statement brings me to one of my main worries. I would like to point out the problem of the brain drain of chemical weapon specialists from Russia to other countries. Because of the deteriorating condition of the military-industrial complex in the former Soviet Union, many specialists in the field of chemical weaponry do not have enough sources of income to support their families and are ready to go anywhere to earn money.

In my opinion, we were all very lucky that the notorious gas attack in the Tokyo subway was prepared and carried out by dilettantes. Had true professionals from Russia executed it using military-strength sarin, there would have been a real catastrophe. Naturally, professionals would know how to carry out such horrible attacks with the most effectiveness. They would find ways to disperse chemical agents that caused much more damage. I hope that you will take steps to prevent this from happening.

If the United States could provide funds to support employment or retraining of Russian chemical weaponry specialists, as they so wisely did in the case of the nuclear specialists, it would be an important contribution to strengthening world peace and security.

Another one of my principal concerns is the danger of dissemination of chemical weapons, a danger far greater than the spread of nuclear weapons. I will be direct. Russia's stockpiles are stored inappropriately, without proper provisions to make sure that they are not stolen.

Unfortunately, this is not only my opinion. My view is shared by some representatives from Duma I talked with in February of this year. The general contractor of the Basalt Research and Development Association informed me that there are several million units of weapons—missiles, bombs, rockets, et cetera—kept in storehouses in Russia. Naturally, it is virtually impossible to control this huge amount of weaponry without computerized inventory-taking methods.

Since corruption flourishes in contemporary Russia, including in the military, the possibility of theft of chemical weapons by guards is very high. One factor which would make such theft easy to accomplish is that the warheads with chemical weapons are kept separately from the powder charges, so a potential criminal would not have to worry about accidental explosion.

Also, the warheads are hermetically sealed against possible transportation accidents, meaning a thief would run no risk of accidental exposure to poisonous gas. Furthermore, considering that no customs agency has any equipment to detect poisonous agents, there are very few obstacles to prevent illegal export of chemical weapons from Russia.

Chemical agents can also be easily carried out from the scientific research institutes which are working with chemical weapons. The procedures to take inventory of chemical weapons there are purely formal and not an obstacle to those workers who might want to steal these weapons.

My own efforts to improve the system during my work at GosNIIOKhT were not successful. Later, I warned about such danger in my presentations at the public conferences in 1993 and 1994. I stressed that the KGB is not particularly interested in firm control over poisonous substances and chemical weapons. As to the possibility of theft in military institutes, it is even more likely because the army has control over its own resources and, as far as I know, up until recent years, KGB activity there was almost nonexistent.

I am sure that the system of international inspections provided for under the Chemical Weapons Convention will help address this problem. International inspectors would be able to count these weapons and keep track of them until they are destroyed safely. Given the aforementioned circumstances, it is very important that outside inspectors begin to exercise control over this situation as soon as possible.

In addition, the Convention's inspections can bring under proper control the new kinds of chemical weapons I wrote about in my articles, the ones not included in the list of controlled chemical substances, including some dual-use chemical compounds. the Convention for the first time provides for routine inspections in industry to make sure that these chemical components are used only for commercial products. It also allows challenge inspections at any place to investigate problem situations. These are very strong tools and I hope that you will do your part to see that they are applied in Russia by pressing for the Senate's ratification of the Convention. Thank you.

Senator NUNN. Thank you very much, Dr. Mirzayanov.

Milton Leitenberg, is that the correct pronunciation?

Mr. LEITENBERG. Light, like electric light.

Senator NUNN. Mr. Leitenberg has spent the last several years studying the Russian biological weapons programs. Mr. Leitenberg has completed a detailed study of the biological warfare program in Russia and the former Soviet Union, which I believe is part of your testimony today. Mr. Leitenberg is a Senior Fellow at the Center for International and Security Studies at the University of Maryland.

Mr. Leitenberg, we are glad to have you.

TESTIMONY OF MILTON LEITENBERG, SENIOR FELLOW, CENTER FOR INTERNATIONAL AND SECURITY STUDIES, UNIVERSITY OF MARYLAND

Mr. LEITENBERG. Thank you very much, Senators. I appreciate the opportunity to testify. I will talk a bit more broadly on biological arms control, in addition to the Russian program. I wanted to talk about four issues: First, what we know about the Russian program; second, a bit about proliferation of BW to other countries, and as a subset of that, something about potential terrorist use of biological weapons or the absence of past terrorist use; and third, a bit about developments in BW arms control, particularly in the last 5 or 6 years.

The Biological Weapons Convention has 5-year Review Conferences. It was signed in 1972 and went into force in 1975. After the Third Review Conference in 1991, when the Cold War was over, there began a move for verification. There had been no verification under the treaty. That was not something the Soviet Union would consider until 1986, with the European CBMs in Stockholm and then the INF treaty in 1987. But from 1991 on, that has been accelerating and I want to say a bit about that and a little bit about the problems of verification.

But first three things about BW and BW arms control which are unique. First, that the treaty was the only one, the first and for a long time the only one, which did away, we thought, with a whole category of one of the three weapons of mass destruction.

Second, the United States had a BW stockpile, and in advance of the treaty did away with the stockpile, between 1969 and 1972. That is altogether unique.

The third thing is unfortunate and is also unique and that is that one of the two major superpowers, the former Soviet Union, was in generic violation of the treaty. We did not and could not get an admission of that. Our official Government statements since 1984 in the annual noncompliance statement to the Congress had stated that they were in violation.

It was not until 1992 that President Yeltsin, coming to this country, was forced by the Nunn-Lugar legislation, which said that before any Nunn-Lugar monies could be given to aid dismantling of the Soviet nuclear infrastructure, the President had to state that the Soviet Union and then Russia was at least in the process of compliance with all arms control treaties. That forced Mr. Yeltsin to admit that the Soviet Union had been in violation.

Then it took a bit longer, until in September 1992, under what was called the trilateral process between the Americans, the British, and the Russians, to obtain an admission that the Russian government, too, perhaps had been in violation for a while. In a continuation of the old style, was the Russian government issued an edict, a decree, saying that the BW program was ended, and that from that point on there would not be an offensive BW program. The United States has had its doubts about that since.

First, a bit about BW proliferation. The BW treaty was signed in 1972, and came into force in 1975 and at that time, according to U.S. Government statements, there were four countries that had biological weapons. France and Britain had them, too, but the British probably gave up their offensive program around 1956 or so, the French just around 1972. But since the treaty came into force, the U.S. government states that about 10 countries have BW programs, and we have to examine that word “about”. I understand that former CIA Director Woolsey recently raised the 10 to 12.

The problem is that the official U.S. Government statements which I am going by, either in the arms control treaty noncompliance documents to the Congress, or in the testimony by the heads of Naval Intelligence—there were three successive statements in 1989 and 1990—these I find, as an arms controller, unfortunate. They are always ambiguous. They are full of phrases about “suspected of having,” or “capability”, and no one outside the government knows what “capability” means. Does that mean an offensive research program? Does it mean testing? Does it mean weaponization? Does it mean production and stockpiling? Those things are never explained.

There is a classified statement to the Congress in the Chemical and Biological Weapons Elimination Act, Public Law of 1991, 102–182. The Congress receives a classified statement describing which countries in the world have biological and chemical weapons programs. However, a non-governmental arms control specialist has no means to match that against the public unclassified non-compliance statements.

That would be very important for you to do, particularly in the last year or two, for example, when both the American and British government identified South Africa as having had a BW program. South Africa never appeared in the public non-compliance statement. Israel would be also a country that one should examine as to whether it was on that classified statement or not.

My prepared submission includes a table based on unclassified official Government statements, including a Russian Foreign Intelligence Service report of 1993. I included a British press compendium because I assumed it was based—I am guessing, I have no direct knowledge—that it was based, nevertheless, on British government information because it matches the number of countries, 10, that the British Defense Ministry also refers to as having BW capability.

It is important to notice that the countries that developed BW after World War II, both major powers and now third world countries that we think are developing or have these programs, if you go down this list, you will see that every one of them either has also developed nuclear and chemical weapons or at least two of the three. According to former CIA Director Woolsey, again, most countries who do go on to develop BW do this after having developed CW.

A large number of those 10 countries, about half of those that we suspect of having BW programs, are in the Middle East. The fact of Israeli nuclear weapons has to be taken into account and usually never is. It is always assumed that that Israeli nuclear weapons are relevant to why Arab mideast states make chemical weapons but nobody has explicitly drawn that connection to their BW programs. We do not know if there is a specific casual relation, but nobody has drawn it, in any case, to BW, even though it is always drawn to CW.

A few comments about Iraq because we know the most about Iraq's BW program, due to the aftermath of the Gulf War and the UNSCOM process. UNSCOM is the U.N. commission that is able to travel inside Iraq and to look anyplace at any time. The first important point is that we would never have learned all that we did except for that process.

The second important point is that Iraq has lied all through the 5 years, consistently, every 6 months or so, as late as July and August. Only the defection of the general who headed the entire weapons of mass destruction programs, which forced Iraq to disclose a lot of information. That is very important because it would have been catastrophic if the sanctions had been revoked before that, which was exactly what Iraq was hoping for, and what France and Russia and China were urging at the UN Security Council. It was only the defection of General Kamel that ended that pressure. Therefore the sanctions are still there, and we know the Iraqi BW program was not disclosed to UNSCOM before in anything close to its completeness.

The other thing that is very important is that every nation from the developing world that has gone into the development of weapons of mass destruction, either nuclear or chemical or biological, has had to depend on technology transfer from advanced industrial countries, and not just those in the West. China, can be the supplier as well. But they have all had to depend on that, and we know that in several of these countries—Iraq was a perfect case—a large amount of the technology, a great majority of it came from Western countries in Europe—France, Britain, West Germany in particular, Switzerland. The bacterial cultures came from the United States.

There are several important lessons here. The first is that information about such technology transfers was available to Western intelligence agencies. We were apparently monitoring that, and we were adding up the sum of money that Iraq was spending for such imports.

The second is that nothing was done in response to that information. The late 1980s was a particular period in which the Bush administration made the diplomatic judgment that it would be more useful to try and talk Iraq into collaboration, rather than publicly disclosing and explaining what Iraq was doing.

The third point is that the technology importation process would have been hindered by export control measures. The Australia Group, which has negotiated export control measures for chemical weapons among 26 countries did not do this for biological weapons until mid-1993. It is not insignificant that Iran, who the United States suspects of having a biological weapons program, has spent several years of diplomatic effort trying to get the Australia Group abolished.

A brief comment regarding BW and terrorism. Historically—for 50 years after World War II—there has been no terrorist use of BW. I wrote my testimony before listening to yesterday's study by the Committee staff. Nevertheless, I am still skeptical regarding some of the allegations that relate to BW agents in the activities of the Aum group in Japan, and which we can go into in questions.

I state repeatedly in my prepared statement that the Aum group failed in making botulinum toxin. They were trying to for 3 or 4 years, but the product apparently did not work. That is very significant, because that group had an incredible amount of money. It had its own facilities to work in. It imported the appropriate technology: fermenters, milling machines, vacuum dryers and so forth, and it had some technically trained people, and again, no lack of money.

As an arms controller I have always heretofore thought that the biological weapon problem, and I have been working on this subject for over 30 years now, since the early 1960s, was a problem of proliferation to states, and at least heretofore was not a problem of terrorist use. Several of the countries in the Mid-East that we suspect of having BW programs—Syria, Iraq, Iran, Libya—these are all countries that have sponsored terrorist groups, and have supplied such groups with explosives and other kinds of technology. They have not heretofore—at least, heretofore—helped terrorist groups do anything in the way of BW.

The best thing that I think the Senate could do to stop further biological weapon proliferation, however, would be, to pass the Chemical Weapons Convention. That would show that the United States was interested in a serious verification regime in the chemical and biological weapons area, and these two are usually considered together. That would show that we are really interested in a verification regime in at least the chemical area and hopefully it is going to move to the biological area.

That means getting the Chemical Weapons Convention to the Senate floor, and not having a situation where one Senator can block an arms control treaty on a weapon of mass destruction—in fact, two treaties on weapons and mass destruction if you include START—a treaty that was presented in 1984 by Mr. Bush when he was Vice President, was signed by the Bush administration, and which took over 20 years to negotiate. That just does not make sense to any arms controller who does not sit in the Senate.

Just a few words on verification and we will turn to the BW program of Russia and the former Soviet Union. Consideration of BW verification has proceeded since 1991 and then particularly since the end of 1993, when a report was submitted by a group of experts convened by a special session of the nations that are treaty signatories. They are referred to as "states parties to" the Biological Weapons Convention.

The American Government is now interested in seeing the same kinds of transparency measures that we worked out with Russia in 1992 in the trilateral process become part of a protocol which would be attached to the Biological Weapons Convention. These include on-site inspections, a verification capability with on-site inspections and with mandatory data exchanges; both of these being mandatory, the data exchanges and the on-site inspection capability. The protocal would have to be separate from the Convention, and it would have to be ratified separately.

Most other Western countries have, in fact, been interested in such additions of verification capability since 1991. We were a bit over-cautious for various reasons in the Bush administration. That has changed now, and hopefully the verification protocal will go ahead by next year when there is the next BWC Review Conference.

Along with the verification experts meetings that have been going on during the past 2 or 3 years, a series of model inspection exercises were held, some international and some national. The international ones were the U.S., British, and Russian ones under the trilateral process, where we have gone to some of their facilities and they have gone to some of our facilities.

However, in the verification experts process, Canada, The Netherlands, and Britain did inspection exercises of pharmaceutical plants in their own countries. One purpose was to examine a consideration that the Bush administration had raised, which was that such inspection exercises could compromise commercial security required by industrial firms. These three nations carried out inspection exercises in pharmaceutical companies in their countries and decided that the problem could be overcome, and that there would not be any compromise of commercial secrecy.

One last word on verification. The material that was prepared for Congress in recent years in two reports by the Office of Technology Assessment, and also in a Congressional Research Service report, were very pessimistic, negative overall, about the capabilities of BW verification. The basic reasons given are because the production equipment is dual purpose, and as people repeat, the facilities do not have to be very large in size, though most of them that have been built by nations in the past have been sizeable.

My prepared statement includes a set of tables prepared by the Armed Forces Medical Intelligence Center in 1993. Those are the U.S. BW intelligence people. The tables consider five indicators of BW facilities—BW facilities of states, not terrorist ones: Funding and personnel, facility design, equipment and security, technical considerations, safety and process flow. They total 40 different aspects. The tables match the 40 aspects in BW facilities and in pharmaceutical and vaccine plants to see whether they are similar or whether they are different. They indicate a rather substantial capability to differentiate between the civil and the military facilities.

Now to turn to the question of the BW program of the former Soviet Union and the present Russian program. As I indicated, the U.S. and UK finally obtained an admission that the former Soviet Union had been in violation. I will just read a brief statement from the 1992 U.S. Arms Control Compliance Report which sums it up:

"The United States has determined that the Russian offensive biological warfare program, inherited from the Soviet Union, violated the BWC, at least through March 1992. The Soviet offensive BW program was massive and included production, weaponization, and stockpiling. The status of the program since that time remains unclear. The modernization of biological agent capability and its toxin research and production in the territory of the former Soviet Union remains a problem." That was in January, 1993, in other words, written at the end of 1992.

We then got the trilateral statement with the Russians, and the critically important sentences in that statement, signed by the three countries together, were that a so-called mobilization capacity—mothballed agent production facilities—that these now be dismantled. The Russians call them "experimental technological lines for the production of agents," that these were to be closed down once and for all. In addition, the group that ran this program in the Ministry of Defense should be disbanded. Apparently, it was just renamed. And also that the program was to be cut by half, by 50 percent in personnel and 30 percent in budgeting.

The U.S. and UK nevertheless remained worried about the program, largely because of a series of defectors from first the Soviet Union and then Russia, who reported that it had not been stopped. President Clinton and Secretary of Defense Perry have been continuing through 1994, and I assume in 1995 as well—to press the most senior members of the Russian government, their counterparts on the Russian side, to make sure that the offensive portion of the Russian BW program is absolutely ended.

Under the trilateral process we have the ability to visit their BW facilities. How many were there? How big was the program? That was a bit of a surprise to an arms controller. The United States had one R&D institution, Fort Dietrick. We had one test site in Utah, Dugway. We had one production facility, Pine Bluff.

It turns out that the Russians had about 20 facilities in all. There were five under the jurisdiction of the Ministry of Defense, two under branches of the Ministry of Defense, and there were another 15 or 16 under a non-Ministry of Defense organization responsible for microbiological production. It is referred to as Biopreparat in short. It has a much longer name in Russian.

The Biopreparat facilities did, some of them, partly civilian along with military work, some only military work, some all civilian work. But there were that many (15–16) that did at least some BW work. In fact, in the early 1990's our greatest concern appeared to be the Biopreparat facilities, and those were the ones that we went to inspect first under the trilateral program.

So the program was very large. It may have had tens of thousands of employees. Again, at least an order of magnitude larger than the U.S. program had been at its peak in 1968 or 1969.

Because of some of the questions that the Committee has been most interested about in terms of the Russian chemical weapons program, the size of the stockpile and the security of that stockpile, those questions may not pertain to the Soviet "B" program. The only time that the U.S. Government has referred to a Soviet BW "stockpile" was in its 1992 statement. There followed a leak to the press which indicated that our intelligence people had some notion about the size of that stockpile.

But there has never again been an official public statement by the Americans or the British about a Soviet BW stockpile, and it does not appear in the U.S.-UK-Russian trilateral statement of September 1992. So I think the present assumption is that there is not a stockpile of BW agents sitting somewhere in Russia, weapons or agents, and that, therefore, security of such a stockpile is not an issue. The BW issue was that mobilization capacity, in other words mothballed production capability, and was that gone or was it not gone? Then there is the same question about the possible exodus, brain drain, of former Soviet and presently Russian people working in BW.

Regarding the conversion of the former Russian BW facilities, I prepared a large study about their conversion last year, and Ms. Harrington in the Department of State, who is the person that works the most closely on that, has just published a paper on the same subject a few days ago, of three or four pages.

There is not a good understanding of what all the 20,000 or so people that formerly worked in the Russian BW program are presently doing. The latest Russian submission under the confidence-building measures of the treaty states that there are only 6,000 people still working in those institutions. In its 1993 declaration Russia still named 12 institutions, the five military, and the seven formerly Biopreparat. (In 1994 this was apparently further reduced to eight.) But we do not have a good grasp, I do not think, of the overall picture.

My own training before I went into arms control was in biochemistry. I taught subjects such as molecular biology, and I therefore have an understanding of the nature of research in a BW laboratory. There should be no group of technical personnel working on any kind of weapon: nuclear, chemical, missile, all the rest, that should be easier to convert than personnel working on BW. All the production facilities are essentially the same as would be used for civilian production and the kind of technical knowledge and capability that the researcher has is exactly the same as in the civilian area.

In the former Soviet Union, there is an incredible need for medical products and pharmaceuticals, and everybody agrees on that. I think we have been suggesting approaches to Russian conversion that are misdirected. We have been stressing joint ventures with Western companies that could produce pharmaceutical products for export that meet the production standards in the West. Most former Soviet pharmaceutical production and vaccine facilities do not meet those standards. But to get the maximum number of people into civilian work that were previously at work in the BW field in Russia, you should focus on products that can be sold in Russia and in the other former Soviet Republics.

There is in fact some Nunn-Lugar funds, a very small amount, that is being used in one of these former Biopreparat facilities. That is under the Department of Defense. There is also a bit more out of the Department of Energy and NASA.

Another problem with some of these U.S. aided "conversion" efforts is that because of the way those programs are designed, they could be open to criticism that we are trying to obtain benefits for our own BW defense program. I think that is a motivation that should be entirely avoided. What we should be interested in is getting the maximum number of Russian research and related personnel in those facilities at work on commercial pharmaceutical products that can be sold within the former Soviet Union, in all the CIS countries, for consumption there.

[The prepared statement of Mr. Leitenberg follows:]

PREPARED STATEMENT OF MR. LEITENBERG

Senator Roth, Senator Nunn, Committee members, I appreciate the opportunity to testify on issues dealing with *Biological Weapons Arms Control.*

I have submitted a background study for the record, which discusses four subjects:

- what was learned in recent years regarding the BW program of the USSR, and now Russia, and what is its present status;
- proliferation of BW: the state of public knowledge regarding those other counties known or strongly suspected of having BW programs, and the question of possible use of biological weapons by terrorists;
- developments in BW arms control since 1975, particularly in the last half-dozen years, and the move towards a verification capability for the Biological Weapons Convention (BWC);
- some discussion of the possibilities and problems of BW verification.

Most of my presentation will be devoted to the issues dealing with the BW program of the USSR and now Russia, but I would like to make several points regarding each of these other major topics.

First, some basic points dealing with biological weapons arms control.

The Biological Weapons Convention was signed on April 10, 1972, and came into force on March 26, 1975, when the U.S., the UK and the USSR deposited their instruments of Ratification of the Convention.

It has had three unique distinctions. It was the first, and for a long time only, post WWII disarmament treaty in which an entire class of weapons of mass destruction was done away with. Or so it was assumed at the time, and the arms control community by and large thought biological warfare had been removed from the scene. Contrary to the nuclear nonproliferation treaty of 1968, there were to be no preferred group of countries that would continue to retain the weapons. Biological weapons were to be prohibited to all, into the future. This was the first major and unique distinction of the subject

The second was that one of the two superpowers—the United States—which did possess biological weapons, gave them up and destroyed them, even before the treaty came into being:

> Biological weapons provide a case in which the usual approach to arms infiltration was reversed. Instead of first negotiating a treaty and then imple-

> menting its provisions, an entire class of weapons was renounced by a major possessor without any prior international agreement. This was in November 1969, when President Nixon, after extensive review, declared that the United States would unconditionally renounce the deployment, procurement, and stockpiling of biological weapons, would destroy all stocks of agents and weapons, and would convert facilities for their development and production to peaceful purposes.

The United States chose this policy at the time to dissociate biological from chemical weapons, the combined and historical framework under which arms control deliberations on them had been carried on for many years in Geneva. Article 9 of the BWC was an undertaking to continue negotiations to achieve a chemical weapon disarmament treaty—but an additional 22 years would pass before that would be achieved on January 1993. The BWC additionally carried no verification provisions; on-site verification was not something that the USSR would consider or accept before Stockholm in 1986 and the INF Treaty in December 1987.

There was however a third major and unique distinction of the BWC: in 1992, Russia admitted that the USSR had been in gross, generic violation of the treaty, the only instance in which one of the superpowers admitted to having been in total violation of a post WWII arms control treaty. By the end of the 1980's it had also become clear that a half dozen or more countries had decided to develop biological weapons in the intervening years. Thus the assumed achievement of the 1970's had been at least in part reversed. Chemical weapons had been used in the war between Iraq and Iran in the 1980's, and in 1991, allied troops that fought Iraq ran a risk of being attacked by both chemical and biological weapons. From the mid-1980's on, there had also been movement to strengthen the BWC and add some kind of verification provisions to it, accelerated by the verification provisions in the chemical Weapons Convention, signed in January 1993. In 1994 it was also reported that "U.S. military doctrine on nuclear weapons since 1993 has assumed the possible use of nuclear weapons to deter or respond to a chemical or biological attack . . .," although there is no official U.S. statement to this effect. All of these factors put BW back in the active arms-control agenda.

THE PROLIFERATION OF BIOLOGICAL WEAPONS

The years since 1972 and 1975, when the Biological Weapons Convention was signed and then entered into force, have been a disappointment for arms control in the biological field. One official U.S. estimate is that "The number of nations having or suspected of having offensive biological and toxin warfare programs has increased from 4 to 10 since 1972," and as the same statement noted, some of the 10 nations in question ". . . are signatories of the BWC." A recent statement by former CIA Director Woolsey has, I understand, raised the "10" to "12." A substantial number of these countries are in the Middle East, and these have either not signed or not ratified the BWC. In 1992 the Bush administration made a concerted effort but failed in the attempt to convince several of the major Middle East antagonists to either sign and/or ratify the BW Convention.

With the exception of the USSR and then Russia, and Iraq as a result of the Gulf War and the UNSCOM process which followed it, there has however been no international pressure or penalty applied against any of the suspected BW states. Until around 1988 no national or international spokesman even made reference to the development, and since then, it has been virtually only U.S. spokesmen that have done so, but within severely restrained limits. The statements have been constantly plagued with ambiguities in their descriptive terminology, such as the words ". . . or suspected of having . . ." in the statement quoted above. In 1990 the Chief of Naval Operations told Congress that "3 countries worldwide now have bacteriological weapons," and that 15 others were *suspected* of *developing* them. Three weeks later the Director of Naval Intelligence identified Iraq, Syria, and the USSR as the three "assessed to have (BW) *capability*." His predecessor had also identified China, Taiwan, and North Korea by name. But what the U.S. governments' criteria were for the categories of "suspected", "developing", and "capability" was never specified, although in this particular pair of statements "capability" apparently meant weapons possession. A statement in the 1992 British Defense White Paper uses the same pattern of ambiguous phrasing, noting that "about ten (nations) have *or are seeking* biological weapons." What was worse, the number of nations "developing" or with "capability" were frequently aggregated with those doing the same for chemical weapons. What one wanted to know explicitly was which nations had BW programs, which had gone into weapons development, testing or weaponization, and which into production or stockpiling of BW agents and weapons. That information was publicly unavailable. The Chemical and Biological Weapons Elimination Act of

1991 (P.L. 102-182) requires an annual report by the President to Congress which contains a complete list of known or suspected BW programs, including those that are classified.

Since the U.S. government has been severely and persistently restrictive in the information that it has released on BW proliferation, perhaps it is assumed that more explicit information would prompt additional nations to take up BW development. I do not know if that is the reason or whether other diplomatic considerations are the cause. *But I believe that the ambiguities are bad for BW arms control, and bad for anti-proliferation efforts.* Since the U.S. listings obviously omit countries that have biological *defensive research* programs—such as the UK, Sweden, The Netherlands, in addition to the U.S. and others—by implication at a minimum those countries it identifies are to be assumed to have offensive programs of varying degrees. My understanding is that the U.S. government does not, however, think that any nation is currently "*producing*" or stockpiling BW agents.

An important additional question for Congress is whether the annual classified compilation it receives from the U.S. government is complete or not. There were apparently years in which the Bush Administration withheld inclusion of China, and with the recent U.S. and British government disclosures on the former South African program, it would be important to check if that appeared in the classified notification in former years, as well as perhaps other countries.

I have compiled a table on BW proliferation based on unclassified U.S. disclosures, and on entries in the 1993 Russian Foreign Intelligence Service report on proliferation of weapons of mass destruction. It is important to note that virtually no nation that has gone into a BW development program has done that without also developing or procuring one of the other weapons of mass destruction, chemical, or nuclear weapons. The paper that I have submitted for the record includes a discussion on each of the listed countries, containing the maximum information that is publicly available.

Nations Having BW Programs At Least Approaching Weaponization

Russia: Ambiguity regarding continuation of offensive program

	U.S. Gov't Arms Control Compliance Reports to Congress (93.95)	Adm.'s Brooks,[1] Studeman, Trost (1988, '90, '91); Sec. Cheney, '90	U.S. and UK governments (1995)	Russian Federation[2] Foreign Intelligence Report, 1993	*The Guardian*[3] (UK. 1991)
Middle East					
Iraq	X	X			X
Libya	X	X		X	X
Syria	X	X			X
Iran	X	X		X	
Israel					X
Egypt	X				X
South/East Asia					
China	X	X			X
North Korea		X		X	X
Taiwan	?	X			X
India[4]				?	
South Korea				?	
Vietnam					X
Laos					X
Africa					
South Africa			X		

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[1] "Statement of Rear Admiral Thomas A. Brooks, USN, Director of Naval Intelligence, before the Seapower, Strategic and Critical Materials Subcommittee of the House Armed Services Committee, on Intelligence Issues," 14 March 1990, p. 54.

"Statement of Rear Admiral William O. Studeman, USN, Director of Naval Intelligence, before the Seapower, Strategic, and Critical Materials Subcommittee of the House Armed Services Committee, on Intelligence Issues," 1 March 1988, p. 48

"Statement of Admiral C A H. Trost, USN, Chief of Naval Operations, before the Senate Armed Services Committee on the Posture and Fiscal Year 1991 Budget of the United States Navy," February 28, 1990.

"Remarks Prepared for Delivery by the Honorable Dick Cheney, Secretary of Defense, American Israel Public Affairs Committee, Washington, DC, 11 June 1990," News Release, No. 294–90, p. 4.

[2] *Proliferation Issues. A New Challenge After the Cold War, Proliferation of Weapons of Mass Destruction*, Russian Federation Foreign Intelligence Report, (translation), JPRS–TND–93–007, March 5, 1993.

[3] *The Guardian*. (UK), September 5, 1991. This source is included because it is assumed to derive its information from UK government sources, which have referred to "around 10" nations with "or seeking" BW. However, the inclusion of Laos and Vietnam seem very dubious, particularly if they refer to the U.S. "Yellow Rain" allegations of the mid-1980s.

[4] In 1994, a Congressional Research Service report included a table of nations either possessing or having "programs" of weapons of mass destruction For Biological Weapons it listed Russia as the only nation with "possession confirmed," Iraq as "clear intent" (which, by 1994, should also have been in the "confirmed" column), China, India, Pakistan, North Korea, Taiwan, Iran and Syria as "probable possession" and Egypt and Libya as "suspected programs." The interesting—or anomalous—listings are of India and Pakistan, which have not otherwise been included in any unclassified official U.S. listings.

J.M. Collins et al, *Nuclear, Biological and Chemical Weapons Proliferation: Potential Military countermeasures,* Congressional Research Service, 94–528S, July 5, 1994, page 2.

(Other versions of this table, essentially based on the sources in footnote 1, were published by Elisa Harris (1991), Nicole Ball and Robert McNamara (1990), and Steve Fetter (1991), the Office of Technology Assessment, U.S. Congress, *Proliferation of Weapons of Mass Destruction,* 1993, p. 82, and Ivo Daalder (1994).)

Of those countries that developed BW after World War II to the stage of weapons acquisition, virtually all either acquired all three categories of weapons of mass destruction (nuclear, chemical, and biological), or at least two and have made attempts at a third:

- the United States, USSR, France, the UK, China, and South Africa procured all three;
- Iraq, had chemical and biological, and was in advanced development of nuclear;
- Israel, has nuclear and chemical; biological is unknown;
- Iran, has chemical and biological; seeks nuclear;
- Libya, has chemical; has sought nuclear for decades, and is seeking biological;
- Syria has chemical and biological;
- North Korea has chemical; sought nuclear, and accepting the Russian assessment, apparently has biological;
- India and Pakistan have nuclear, chemical and biological are unknown;
- Taiwan has chemical, South Korean chemical is ambiguous, and both had incipient nuclear programs in the late 1970's.

According to a statement by former CIA Director Woolsey in 1994, nations developing and procuring BW have usually done so following their procurement of CW, and it has frequently been stated that various Arab states in the Middle East developed chemical weapons because of Israel's possession of nuclear weapons. There are no statements or analyses that have extended this rationale specifically to their development of biological weapons as well, although it is an easy, logical extension to make. In Anthony Cordesman's phrase. "Nations that are interested in biological weapons are already interested because they offer an alternative to nuclear weapons. . . ." It would not be altogether surprising if one learned that some governmental policy group in these states that had considered or was urging the acquisition of nuclear weapons had spun off the suggestion to develop biological weapons. Nevertheless, nothing is publicly known regarding the policy decisions in these states regarding BW development.

I want to comment here in particular only on Iraq, about whose BW program we now know the most.

- *First,* that we learned what we did only as a coincidence of the Gulf War, the severe and intrusive restrictions that were placed on Iraq under resolutions of the United Nations Security Council, including the UNSCOM process [the United National Special Commission], with its authority to go anywhere in Iraq, inspect any site, repeatedly, and obtain all information dealing with all of Iraq's former programs to develop and produce weapons of mass destruction. Economic sanctions would have obviously never have produced any of these disclosures.

- *Second,* that the Iraqi government had lied continuously, even as late as in its July 6 "disclosures" and its August 4 "Full, Final, and Complete Disclosure." Iraq's credibility is nil, and everything must be verified. Under conditions of a police state determined to lie, UNSCOM and the inspections were not able to turn up major portions of the relevant evidence regarding documents, culture media, research personnel, destruction or non-destruction of agents, etc., only strong suspicions as a result of discrepancies. UNSCOM noted in August that "Iraq has now acknowledged a much more extensive program than UNSCOM had been able to piece together over four years through a process of gathering independent information outside the country and then confronting Iraq with it."

- *Finally,* that it would have been catastrophic to have revoked the sanctions, as Iraq continuously demanded and its UN Security Council advocates—Russia, France, and China—urged, prior to UNSCOM's absolute certainty that

> Iraq had thoroughly complied with the original provisions of the UN Security Council's resolutions. Clearly, Iraq had hoped to get the economic sanctions lifted *without* fully disclosing its BW program. Only the defection on August 7 of General Kame ruined that plan.

In addition, *every* nation that has produced weapons of mass destruction—nuclear, chemical, and biological—and most particularly those in the less industrialized or "developing" nations, have relied on external assistance: the purchase and importation of technology, equipment, and personnel. The personnel—advisers, scientists, technicians—bring knowledge. Iraq's BW program was no exception. Equipment, technology, and materials were procured overseas, from the USSR, France, West Germany, and even the United States. And a substantial amount of this was late in the game.

In 1989 Iraq bought a wide variety of biotechnology equipment from various German supply firms, and additional fermenters, also from Germany. Altogether, 24 West German firms were involved in the construction of production facilities for biological and chemical weapons in Iraq; the chemical weapons production infrastructure being by far the larger of the two. During the late 1980s U.S. intelligence services reportedly tracked the exports of dual use equipment that could be used for producing biological weapon agents from European countries to Iraq, and concluded that Iraq had spent approximately $100 million on its BW program between 1980 and 1990, and that Iraq was producing and stockpiling BW agents.

This has several clear implications:

- Information was available to Western intelligence agencies.
- Nothing was done, however. In fact, the late 1980s was a period in which the Bush Administration was following a diplomatic agenda of courting Iraq to solicit its good behavior.
- The process could have been severely handicapped, if not stopped, by Western export controls. The Australia Group, 26 nations with agreed export control procedures for materials that could lead to the production of chemical weapons, extended its agreements in June 1993 to manufacturing equipment and agents that could produce BW. It is certainly significant that Iran—a country that possesses chemical weapons and is suspected of having developed biological weapons—spent several years trying to get other nations to support it in a campaign to pressure the Australia Group to disband.

THE POTENTIAL USE OF BW BY EXTRA-NATIONAL, OR "TERRORIST" GROUPS

There have been many warnings over a period of several decades of the possible use of BW by terrorist groups. The reason given is the ostensible ease of preparation of such agents. Nevertheless to this date no such use has ever taken place. The most serious attempt to produce an agent, which nevertheless failed, was made by the Japanese Aum Shinrikyo group in the early 1990s. The same group did go on to manufacture and use the chemical agent Sarin in 1994, and then in March 1995 in Tokyo. Over a period of 50 years, there is a record of no more than a half dozen threats worldwide by groups or individuals to use BW.

There are two significant aspects of the Aum Shinrikyo attempt. The first is that although it appears to have been the most serious attempt on record, with no lack of resources and time, it failed. The second is that the perpetrating group was most certainly not an ordinary "terrorist" group. As for resources, they were virtually unlimited in financial terms, the group had established front companies for purchasing, had bought the appropriate equipment, had years in which to work, and had a small staff of scientifically trained personnel. Nevertheless, they failed to produce the agent that they were trying to make.

My own view is that the major problem regarding biological weapons is to prevent its development by states. I still think that is the case. The greater number of states that develop BW, the greater will be the eventual likelihood that it may be taken up for use by terrorist groups. If the U.S. Senate wants to inhibit the possible eventual use of BW by terrorists the most effective thing that it could do would be to support the forthcoming protocol to the Biological Weapons Convention that would have *greatly* strengthened verification provisions, including provisions for mandatory on-site inspection, even though such a convention would have direct impact only on states. And the best way to do that would be to have the Senate ratify the *Chemical Weapons Convention*. That would be a crucially important step, *establishing the U.S. interest in a serious verification regime in the C and B area*. And that obviously means getting the treaty to the Senate floor, and ending the ability of a single U.S. Senator to prevent a major arms control treaty on one of the three categories of weapons of mass destruction—a treaty that the Bush Administration had championed, that the United States signed, and that took over twenty years of international negotiations to achieve—from being put to the U.S. Senate for ratification.

BIOLOGICAL WEAPONS ARMS CONTROL SINCE THE THIRD BWC REVIEW CONFERENCE (1991); MOVEMENT TOWARD VERIFICATION CAPABILITIES, AND THE POSSIBILITIES AND PROBLEMS OF VERIFICATION

By 1994 the United States was interested in seeing that a series of "transparency measures" similar to those that the United States, Russia, and the UK had agreed on in the trilateral process in September 1992, be extended on an international basis to all States Parties of the BWC. That included *mandatory* data exchanges, or declarations, and *mandatory* on-site visits. *Both aspects are essential: whatever will be decided on must be mandatory and there must be some on-site inspection capability.* The administration should be pushing as hard as it can to see that a new Protocol to the BWC that will be ready in time for consideration at the Fourth Review Conference in 1996.

The purpose of the mandatory declarations would be to provide a database on the facilities that were of the greatest potential danger to the BWC, the most convertible, and the easiest to disguise. That includes all facilities with high containment, all that used listed organisms, and all national biological defense programs. Over a period of years such declarations would presumably provide a profile of "a national pattern of activity." If that profile changed it could provide reason for an on-site visit. Such visits would have to take place on relatively short notice, and they would be to any declared or undeclared site, or to a site of alleged use of BW.

The U.S. government's position is now the same as that of all the other Western nations, that having more information is unquestionably better than having less, and that there must be an on-site inspection capability. Nations that stay out of the regime will be suspect. For those that join the regime, the ability to demand inspections will supply the international community with leverage and pressure. *There is no leverage at all without such a regime.* The important point is not that there might still not be 100 percent absolute certainty of discovering a violator, but that without it, there is no ability whatsoever to go in and look. The Protocol would require a new cycle of ratifications, separate from the BWC. There would have to be some kind of secretariat and inspecting agency, analogous to the OPCW provided for by the Chemical Weapons Convention.

The verification problem is simply the ability to *find* and then to *distinguish* prohibited from permitted activity. In BW this is complicated by the fact that the facilities—at least in theory—need not be very large, although all the national facilities identified to date have been sizable, and the equipment is for the most part dual purpose.

In the 1990s, two circumstances gave rise to a substantial group of BW inspections, some as national exercises, and some on an international and official level:

- The U.S.-Russia-UK "Trilateral" process led to U.S.-UK inspection visits to Russian facilities, and to Russian inspections of facilities in the U.S. and UK.
- As part of the VEREX process, three Western governments—the UK, The Netherlands, and Canada—ran trial inspections of commercial facilities in their respective countries.

The British, Canadian and Dutch government exercises were carried out specifically to ascertain if serious, intrusive inspections of commercial facilities could be carried out without the compromise of commercial proprietary information. Their reports to the VEREX stated that that was possible without any great problems.

Reports to the U.S. Congress by the Congressional Research Service (1994) and the Office of Technology Assessment (1993) have emphasized the similarities between equipment used for peaceful purposes—vaccine production—and military ones—the production of BW agents—and the resulting difficulties in inspection and verification for BW.

I would like to submit evidence that emphasizes the ability to distinguish. These are a set of tables prepared by the Armed Forces Medical Intelligence Center in 1993 entitled "Signatures for Biological Warfare Facilities." It divided indicators into five categories:

- funding and personnel,
- facility design, equipment, and security,
- technical considerations,
- safety, and
- process flow.

Under each of these categories it listed a series of either common or quite dissimilar characteristics in a "BW facility" and in a "legitimate facility." For example, the nature of waste treatment, location of air filters, air pressure gradients, the location of refrigerated bunkers, facility security, etc. Forty such characteristics were evaluated and provide substantial differentiation between the BW facility and the presumptive pharmaceutical or other commercial site.

Signatures for Biological Warfare Facilities

(ARMED FORCES MEDICAL INTELLIGENCE CENTER)

1. *Funding and Personnel*

BW Facility	Legitimate Facility
1. Military funding	1. Private enterprise or nonmilitary
2. High Salary	2. Salary within normal limits
3. Funding exceeds product/research output	3. Average or underfunded for expected output
4. Scientists/technician ratio high	4. Average ratio
5. Limited Ethnic diversity	5. Integrated work staff
6. Elite work force/foreign trained	6. Local trained work force
7. Foreign language competency	7. Limited foreign language capability
8. High ratio of military to civilian	8. Military personnel unlikely

2. *Technical Considerations*

BW Facility	Legitimate Facility
1. Pathogenic or toxic strains	1. Non-pathogenic or non-toxic strains
2. Test aimed at killing animals	2. Test aimed at protecting animals
3. Facilities for large animals such as monkeys	3. Facilities for smaller animals, specific inbred strains
4. Negative air flow	4. Positive air flow
5. No commercial products	5. Commercial products
6. Weapons filing equipment	6. Bottle filling equipment

3. *Facilities, Security, and Equipment*

BW Facility	Legitimate Facility
1. Access control: High walls, guard towers, motion detectors, video cameras, elite security force, badges and clearances	1. Average security, badges at most
2. Transportation provided	2. Public/private transport
3. Quarantine facilities on compound	3. No quarantine
4. Foreign travel restricted, highly available	4. Unrestricted but not readily available
5. Refrigerated bunkers secure area	5. Cold rooms in facility
6. Advanced software, external data base access ADP security high foreign access	6. Open information except for proprietary information
7. Static aerosol test chambers	7. No aerosol test chambers
8. Military with weapons expertise	8. No need
9. Rail or heavy truck required for weapons filling facility	9. Only light truck transportation

4. *Safety*

BW Facility	Legitimate Facility
1. Physical barriers to prevent animal to animal and animal to human transmission	1. Physical barriers designed to prevent animal to animal and human to animal transmission
2. HEPA filters present, exhaust	2. HEPA filters possible, intake
3. Dedicated biosafety personnel	3. May or may not be present
4. Infectious and toxic agent trained medical staff	4. Dedicated highly trained staff not likely
5. Decontamination equipment and showers	5. Not needed or large scale
6. Large capacity pass through autoclaves	6. Small bench top autoclaves
7. Dedicated waste treatment	7. Waste treatment common with local facilities
8. Special sterilization of waste	8. May or may not exist
9. Test animals sterilized before final disposal	9. Animals may not need to be sterilized before final disposal

5. *Process Flow*

BW Facility	Legitimate Facility
1. Raw material consumption doesn't equal output	1. Raw material consumption relates to output
2. Large volume fermenters (greater than 500 liters) cell cultures (1000's of culture flasks/roller bottles) embryonated eggs (100's thousands)	2. Large or small scale fermentation but cell culture and eggs in smaller volume
3. Air pressure gradients keep microbes in vessel	3. Air pressure gradients keep contaminants out of vessels
4. finished product—wet stored at low temperature in sealed (often double packaging) containers—not readily identifiable	4. Labelled by product, batch number, date, etc.
5. Milling equipment operated in biohazard protective suits	5. Milling equipment is not operated in biohazard areas
6. Storage—low temperature, high security, bunkers with biocontainment	6. Storage in temperature controlled environment, clean warehouse conditions
7. Munitions—special filling buildings and/or explosives handling facilities	7. Non-issue

THE BIOLOGICAL WEAPONS PROGRAM OF THE FORMER USSR AND PRESENT-DAY RUSSIA

The 1992 U.S. government arms control compliance report (released on January 19, 1993) stated

> The United States has determined that the Russian offensive biological warfare program, inherited from the Soviet Union, violated the Biological Weapons Convention through at least March 1992. The Soviet offensive BW program was massive, and included productions weaponization, and stockpiling. The status of the program since that time remains unclear. . . . The modernization of biological agent capability and its toxin research and production in the territory of the former Soviet Union remains a concern.

The only other reference to former Soviet BW "stockpiles" was an April 1992 *Washington Post* press report that claimed that "Western Intelligence" had developed an estimate of the size of that stockpile by stating that Russia was only reporting "10 percent" of the amount that these intelligence sources believed existed. However, there has never again been any official government reference to a Russian BW stockpile, and no suggestion of one appears in the September 1993 U.S.-UK-Russian trilateral statement. In addition, as the Russians have constantly denied having maintained any BW stockpiles, it is not clear when or under what circumstances the "10 percent . . . reporting" by Russia took place.

For these reasons, some of the questions that the Committee focussed on in relation to the Russian *chemical* weapons stockpile—its size, its location, its security, risks of diversion of any portion of it—may not pertain to the Russian biological weapons program. The key questions that do exist are the nature and size of the remaining Russian BW program and the "mobilization capacity"—mothballed agent production facilities—and the degree to which it had or has not been dismantled or destroyed. The possible emigration of relevant Russian scientific personnel is also an issue, or the transfer of their knowledge by working for a foreign nation while remaining in the USSR.

In 1984, the U.S. government stated that the USSR was violating the Biological Weapons Convention. However, it was a defector from within the Soviet BW R&D establishment who reached London in 1989 that prompted President Bush and Prime Minister Thatcher to repeatedly press Soviet President Gorbachev on the issue. It was only on the eve of President Yeltsin's visit to the United States in February 1992 that the conditions stipulated in the Nunn-Lugar legislation forced a Russian admission that the USSR had maintained a BW program that violated the Biological Weapons Convention. That legislation required President Bush to certify that the USSR and then Russia was committed toward compliance with all arms control agreements before any U.S. financial assistance could be provided to aid in the dismantling of nuclear weapons and other weapons of mass destruction in the USSR/Russia.

In the succeeding months, however, the British and U.S. governments remained apprehensive about the Russian BW program and whether activities continued that violated the BWC. In September 1992 they obtained Russian agreement to the establishment of a "trilateral" process of information sharing and mutual site visits in an effort to increase the transparency of the Russian program and to bring an end to any possible activities not permitted by the BWC. The trilateral statement "confirmed the termination of offensive research, the dismantlement of experimental technological lines for the production of agents, and the closure of the biological weapons testing facility" in Russia. It also "dissolved the department in the Ministry of Defense responsible for the offensive biological . . ., cut the number of personnel involved in military biological programmes by 50%, (and) reduced military biological research funding by 30%."

U.S. and British concerns apparently continued, however. In April 1994 U.S. officials were quoted in the press as saying, "We have evidence that leads us to understand that there is still an offensive biological weapons program underway (in Russia). . . . We are very concerned that large aspects of the program are continuing. . . . Yeltsin's decrees have not filtered down to the working levels." The unclassified version of a special U.S. government report in October 1994 on Russian compliance with biological and chemical arms control agreements stated that "The U.S. continues to have concerns about Russia's compliance with the BWC." The U.S. government has continued to press these issues directly with President Yeltsin, by President Clinton during his visit to Moscow in January 1994, during U.S. Secretary of Defense Perry's visit to Moscow in March 1994, and at the September 1994 Yeltsin-Clinton Summit meeting. Given the history of these events since 1989—a period of six years—it is unfortunate that neither the Soviet nor the Russian senior military or political leadership hasn't sought to do away with any residual portions of the USSR's offensive BW program in a patently open and visible way so as to remove as much grounds for doubt as feasible.

How big was the Soviet and then Russian BW program? It was apparently an order of magnitude larger than that of the United States at its pre-1969 peak. In 1987, under the BWC CBMs, the USSR reported the five BW laboratories that it maintained under the direct control of the Soviet Ministry of Defense. However, the U.S. and British governments became concerned about a second system of facilities that were under the nominal jurisdiction of the USSR Ministry of the Medical and Microbiological Industry, which has mostly been referred to as the "Biopreparat" organization (or Glavmikrobioprom, the Main Administration of the Microbiology Industry). A still-classified 1992 U.S. intelligence report referred to "16 known and suspected (Soviet) biological weapons facilities," up from nine previously "identified," a number that was soon increased to twenty. What is even more important is that this entire secondary system was only established in 1973: the Soviet institutes, laboratories, and administrative structure that were in violation of the BWC were established for the greatest part after the 1972–1975 period, after the United States dismantled most of its BW research apparatus and destroyed its production facility and BW stockpile, and the BWC came into force.

In its 1993 BWC declaration, Russia listed the five primary Ministry of Defense facilities and seven others as remaining, with a combined staff of at least 6,000. Under the trilateral process, the U.S. and UK have been able to make visits to the Biopreparat facilities, but although it has been trying to negotiate visits to the five facilities run by the Ministry of Defense, these site inspections still have not taken place.

Conversion of former BW R&D institutions should be easier than in perhaps any other kind of former defense facility. The need within Russia for civilian products that these institutions could produce is both manifest and enormous. Nevertheless, it is extremely difficult to obtain information on what is taking place in these twenty-odd institutions by way of conversion. The U.S. Department of Defense, NASA, and the Department of Energy all have small programs of aid and involvement with several of these institutes. However, I think there are important questions regarding the judiciousness of some of these programs. The International Science and Technology Centers (ISTC) are also attempting to aid the conversion of several of these institutes. The major issues should *not* be privatization or the production of products exportable to the West, but rather

- large-scale and more rapid demilitarization of the institutes
- broader employment within them by the production of products needed within Russia and the other areas of the former USSR.

Regarding the emigration of personnel from these institutes, information is very sketchy, but there has apparently been some. My only information is dated, over two years old, and indicates a low level in numbers, some tens of individuals apparently, and some of those have come to the United States.

SUMMARY

Biological weapons were fortunately not laid to rest in the years 1972 to 1975. Several nations have gone on to develop the capability to produce BW at short notice, and have done so precisely in the years since the Biological Weapons Convention came into force.

The USSR's and presently Russia's continuing slowness in putting a certain and definitive end to any portions of its own BW program not permitted under the BWC has been a severe impediment to international efforts to stop and to reverse any further trends towards BW proliferation. First, because Russia inherited one of the two major post-WWII offensive BW programs, and which the USSR had continued despite signing and ratifying the BWC. That established an extremely damaging precedent and the apparent continued resistance to making a determined show of reparations by wiping out any non-permitted remainders of the program once and for all only add further damage to the BWC. It is important that Russia remove whatever secrecy remains surrounding its BW establishments, both military and civilian. Second, because it weakens the combined efforts of the major powers in applying pressure on those nations that have more recently developed BW programs to begin reversing and expunging them.

Nations that have developed BW programs in recent years such as Iran and Libya are not particularly open to argument. The major institutional indicators, secrecy and the role of military or intelligence agencies in funding and managing BW programs, are constant indicators of problems, and most certainly when all three occur together. Much more thought should be given to the pressure of sanctions by the international community. Following the additional example of Iraq, a state that had gone on to develop BW despite having signed (although not ratified) the BWC, much more thought particularly needs to be given to the circumstances in which a State Party to the BWC shows evidence of developing the prohibited weapon system, and the sanctions that should be applied in such instances.

It appears that the next year will see the proposal of an international verification regime as a Protocol to the BWC. It would require an international monitoring organizations probably similar to that which has been established under the Chemical Weapons Convention. It is very likely that such a regime will provide for the opportunity for both routine and challenge on-site inspections to facilities or locations in member states. Domestically, the U.S. government runs the risk of having impeded its current efforts to defeat the further spread of a weapon of mass destruction by greatly exaggerated concerns several years ago regarding corporate commercial secrecy. Trial inspections carried out by several western nations in recent years as a contribution toward producing a strengthened verification regime for the BWC showed that this was a manageable concern. It will be important for the U.S. government to maintain its focus on stemming BW proliferation as its first and overwhelming priority in that field, and that all its other considerations that relate to that effort be so adapted as to aid in that endeavor.

Senator NUNN. Thank you, Mr. Leitenberg.

Mr. Moodie, we are pleased to have you back with us. Michael Moodie is the President of the Chemical and Biological Arms Control Institute, a non-profit research organization established to promote the goals of arms control and nonproliferation and former Assistant Director of Multilateral Affairs of the U.S. Arms Control and Disarmament Agency. Mr. Moodie will discuss what actions the U.S. Government needs to take regarding the chemical and biological area.

TESTIMONY OF MICHAEL MOODIE, PRESIDENT, CHEMICAL AND BIOLOGICAL ARMS CONTROL INSTITUTE

Mr. MOODIE. Thank you very much, Mr. Chairman. It is a privilege to appear before the Subcommittee today.

I was asked to begin to try to bridge the previous discussions of yesterday and this morning on the nature of the current proliferation threat and the panel to follow addressing policy responses. I would begin with a basic question: Are current U.S. policy approaches adequate to the task of responding to the problem of proliferation in the post-Cold War order?

I would submit that both the international security environment and the global processes for developing and disseminating technology have radically altered in the last several decades; yet, conceptual and policy thinking remains locked in modes more appropriate to an earlier time. My bottom line is that the United States needs an innovative strategy that challenges traditional ways of thinking about proliferation.

I would like to highlight four aspects of conventional thinking that must be critically reexamined. First, discussions of proliferation, official and unofficial, have been fixated on the nuclear dimension. Other dimensions of the proliferation challenge, however, that I have pointed out in my written statement, pose risks potentially as consequential and perhaps more imminent than the spread of nuclear weapons.

To me, this nuclear fixation must be overcome. The problem is not just about nuclear weapons or even about weapons of mass destruction. One could argue it is not even about weapons anymore. In my mind, the core of the proliferation problem in the post-Cold War security environment is the diffusion of technology, some of it advanced, some of it simple, all of it potentially deadly. Proliferation today is as much about lasers and computer software as it is about plutonium and anthrax.

If the problem is recast in these terms, it is essential to recognize that it is not the technology itself that is beneficial or harmful but how that technology is used, and that is the result of human choice. It is critical to appreciate this fundamental point because the essential focus of our policies should not be on denying key technologies, as is now often the case, but on channeling the choices of those, whether leaders of states or non-state actors, to whom that technology is increasingly available.

Second, more attention must be paid to the decision making processes of proliferators, both at the state and the sub-state level. The efforts of Iraq, North Korea, and other proliferators reflect decisions as complex as the multiple capabilities they are trying to acquire. Although it is admittedly difficult to secure information regarding these decision making processes in many countries and particularly with sub-state groups, getting inside that process is absolutely essential, and insights gained from looking at that process may open new policy approaches.

At the sub-state level, a major question raised by the attack in Tokyo is why terrorist groups have not used such weapons before, despite WMD technology that is now many decades old. The fact that it was the Aum Shinrikyo in Japan that resorted to chemical weapons perhaps provides one clue.

In my view, the Aum is not a group akin to those which emerged in the late 1960s and early 1970s, such as the IRA or some of the militant Palestinian groups. These groups resorted to terror to achieve specific political objectives. Their weapons of choice were the gun and the bomb, those favored by terrorists throughout history. An important part of their approach was to claim responsibility for particular incidents, sending the message that similar incidents would occur in the future if the desired action by governments were not taken.

The Aum Shinrikyo's attack in Japan had none of these features. In not claiming responsibility for the subway tragedy, the attack was not tied to any government action or concrete objective. With no stated goal, the attack appeared more as an act of random violence than a political undertaking. In general, in my view, the Aum Shinrikyo appears to have more in common with bizarre religious cults, only that the Aum directed its violence outward towards society as well as inward toward members of the sect itself.

A group such as the Aum, therefore, is something new, something of a hybrid, and groups such as these seem to be willing to use violence, including weapons of mass destruction, just to hurt society. A critical first step in dealing with these new groups is to learn better how such a group thinks and the factors involved in the decisions they make.

Third, not all members of the international community view the proliferation problem through the same lenses. Some developing countries, for example, consider nonproliferation efforts of the United States and the other industrial nations, such as the Australia Group and the missile technology control regime, as hypocritical, selective, and discriminatory.

Major differences exist over the competing needs to protect technology on one hand and share technology on a global base on the other. Those differences are now a theme in virtually every current or recent multilateral arms control forum, including the conference to decide on the extension of the Nuclear Nonproliferation Treaty, the work in The Hague on implementation of the Chemical Weapons Convention, and efforts to develop measures to bolster confidence in compliance with the Biological Weapons Convention. Some means must be found to bridge these differences over technology sharing.

Finally, if this portrayal of the proliferation problem as a multifaceted challenge of technology diffusion is correct, no single solution to the problem will suffice. Too often in the past, those responsible for different aspects of policy have worked in isolation from one another. An effective government mechanism to integrate the full range of policy tools, an approach that is sensitive to the balance that must be drawn among the use of these instruments, has not really existed.

But a number of tough questions exist with respect to each policy element that should be incorporated into such an integrated strategy, and let me briefly highlight a couple.

First, effective intelligence, as has been pointed out here over the last 2 days, is absolutely critical in countering proliferation successfully. It is also difficult. The biggest intelligence coups related to biological weapons programs, for example, in Russia and Iraq, have been for the most part in some way related to defectors.

What then are or should be our expectations regarding intelligence capabilities in this area? How should the traditional tension between investment in national technical means and investment in human intelligence capabilities be resolved in meeting the proliferation challenge?

Another issue not often examined is what intelligence demands are created when proliferation occurs? One example is the use of intelligence for target identification supporting the possible use of military power to take out a WMD facility. Do we today have the necessary intelligence capabilities, recognizing that during the Gulf War, a number of Iraqi WMD facilities apparently were not identified?

The impact of the proliferation of weapons of mass destruction can be diminished if effective defensive programs are incorporated into the strategic approach. One defense program issue raised by the Tokyo tragedy is civil preparedness against a potential terrorist attack. To what extent should it be made a national priority? As an open society, the United States will never enjoy total invulnerability against those committed to making such attacks. But how can civil emergency preparedness be improved so that the consequences of an attack, should it occur, are minimized?

The U.S. Government has made progress in this area and some municipalities have conducted exercises to facilitate coordination of law enforcement, medical, and other services that must be involved, but are those efforts enough? Have efforts been adequate across the country?

Another aspect of the defense program is military preparedness and the capability of U.S. forces to operate effectively in a WMD environment. A number of published reports over the summer raise questions regarding the level of preparedness and the proper configuration and training of U.S. forces for operations in areas where proliferation has occurred. It also poses the question of acquisition policies for such contingencies, including missile defenses, an issue with which Congress has struggled for some time.

Export controls have been a centerpiece of U.S. nonproliferation efforts. Their effectiveness, however, in my view, is of growing concern in light of the dual use nature of much of the technology that now has relevance in the security arena. In a report for our institute provided to the Subcommittee, Brad Roberts of the Institute for Defense Analyses provides some striking statistics on trade in these materials that are summarized in my written statement.

These trade and investment figures do not necessarily imply that the recipients are pursuing weapons of mass destruction programs. They do suggest that the issue is no longer whether a state has the technological capability or the access to technology and material to provide itself with weapons of mass destruction but whether it has the political will and makes the choice to do so.

Arms control treaties and agreements, such as the as-yet unratified CWC, can also make several contributions to the fight against proliferation. You have heard about some of them already this morning. I would note, however, that arms control, as any other policy instrument, is not a panacea, and we should not expect arms control agreements to carry more of a burden than they were originally designed to bear.

One aspect of arms control in my view deserves special attention. It has been an issue that the international community has traditionally avoided raising in polite company. That is, what to do in response to instances of noncompliance. In 1963, Dr. Fred Ikle wrote a classic article entitled, “After Detection, What?” I expect Dr. Ikle is still looking for an answer.

Differences with our allies as well as with the Russians over the Krasnoyarsk radar, the incident in Sverdlovsk, or the reluctance of the Security Council to move against a North Korea clearly in violation of its NPT obligations demonstrate that responding to noncompliance is one of the most politically contentious questions in the arms control arena today. More deliberate attention must be given to appropriate responses to violations of arms control agreements before they occur, as we should expect they will.

Finally, an integrated anti-proliferation strategy must involve a wider range of players than has heretofore been the case. For example and perhaps most importantly, how do we integrate into nonproliferation efforts the private sector, which today is by far the most significant conduit for the global dissemination of technology?

Clearly, there is a strong need for innovative thinking in order to fashion an effective approach to the problem of the diffusion of militarily-relevant technology. An integrated strategy that challenges conventional wisdom, that focuses on the gaps in thinking and policy, and that addresses these and other tough questions is essential. Thank you very much.

[The prepared statement of Mr. Moodie follows:]

PREPARED STATEMENT OF MR. MOODIE

Mr. Chairman, thank you very much for your invitation to testify before the Subcommittee. It is an honor to do so.

I have been asked to begin to bridge the previous discussion of the nature of the current proliferation threat and the panel to follow addressing policy responses. I would like to do so by focusing on a series of questions raised by the current U.S. approach to the challenge of nonproliferation and possible policy options.

THE FUNDAMENTAL QUESTION

The challenge of proliferation today reflects the complexity of the post-Cold War world in that responding effectively to the challenge requires balancing several competing, equally valid interests. The critical issues not only relate to national security and global peace and stability, but they also have significant repercussions for economic interests including U.S. high technology trade and economic development in industrializing countries.

Are current U.S. policy approaches adequate to the task of responding to the challenge of proliferation in the post-Cold War era? The collapse of the Soviet Union, Iraq's challenge to the international community, North Korea's rogue actions, and the subway attack in Japan, have all highlighted new dimensions of the threat confronting the global community. Serious questions exist as to whether business as usual—embodied in strategies of technology denial—will work in today's world. That world is one in which many of the same technologies that can be used in potentially destabilizing military applications, can also make widespread and valuable contributions to society. It is a world in which those technologies are increasingly available on a global basis. Although both the international security environment and the global processes for developing and disseminating technology have radically altered in the last twenty years, conceptual and policy thinking remains locked in modes more appropriate to an earlier time. The United States needs an innovative strategy that challenges traditional ways of thinking about proliferation in order to identify new policy approaches more responsive to the problems Washington will confront in the years ahead.

REEXAMINING CONVENTIONAL WISDOM

Five aspects of conventional thinking about proliferation in particular must be critically examined.

First, discussions of proliferation—official and unofficial—have been fixated on the nuclear dimension of the issue. The problem, however, is far more complex that just the spread of nuclear weapons. Other dimensions of the proliferation challenge pose risks potentially as consequential and perhaps more imminent than the spread of nuclear weapons, including

- increased interest in biological and chemical weapons;
- ongoing acquisition of advanced conventional weapons;

- development of missiles of increasing range and accuracy;
- widespread availability of light arms that have killed many more people than weapons of mass destruction;
- growing interest among many countries in the world in acquiring subsystems and components;
- increasing acquisition by the global community of enabling technologies that enhance military performance such as computer-aided design and manufacturing systems, systems integration software, precision guidance, advanced information technology, etc.;
- global dissemination of sophisticated technology production techniques; and
- greater application of technology generated in the commercial sector to the security arena.

The nuclear fixation in proliferation discussions must be overcome. The problem is not just about nuclear weapons, or even weapons of mass destruction. One could argue it is not even about weapons anymore. The core of the proliferation problem in the post-Cold War security environment is the diffusion of technology—some advanced, some simple, but all potentially deadly. Indeed, the term "nonproliferation" may no longer be adequate to describe the goal; perhaps a more accurate description of the task is "managing diffusion of militarily-relevant technology.

If the problem is recast in these terms, the first step in dealing with it is to recognize that the impact of technology in the security arena is the product of human choice. Technology may help define the context within which choices are made, create new paths for the chooser, or change the calculations of costs and benefits associated with certain courses of action. The result, however, is determined by individuals. It is not technology itself that is beneficial or harmful, but how it is used. This fundamental point is critical to those who must respond to the proliferation challenge, because it highlights the fact that the basic task should not be focused on the technology, but on channeling the choices of those to whom that technology is available.

Second, much of the recent analysis tends to define proliferation as the primary concern and the political environment in which it occurs—usually characterized by conflict—as derivative. (This portrayal is suggested in the labeling by some Clinton administration spokesmen of regional security problems as "demand side proliferation.") Such an approach tends to drive policy toward a narrow focus on technology and its denial to countries of concern.

A strong case can be made, however, that the relationship between conflict—whether it is between states or within a state—and proliferation is just the reverse of this now-common portrayal. It is the existence of conflict that drives the parties to consider using new tools of violence. The impact of this view should be to promote policy approaches that emphasize both national and global norms against the misuse of technology and heighten the disincentives for potential proliferators. It should also lead to emphasis on combining policy instruments—intelligence, defense programs, military options, export controls, in some cases law enforcement, arms control, and so on—into an integrated approach which has been largely absent to date.

Third, more attention must be paid to the decision making process of proliferators both at the state and sub-state level. In many proliferation discussions, that process is often portrayed as if a state moves in sequence from one weapons systems to the next ("Well, nukes were too hard or too expensive, so I'll try biological weapons"). In reality, the process is usually not sequential, but simultaneous and across the board. Iraq, for example, not only had an elaborate nuclear weapons program, but also had tens of thousands of munitions filled with chemical agents, an active offensive biological weapons program, an indigenous missile development program, and a tank army larger than those of Britain and France combined. North Korea is on everyone's list for pursuing all weapons of mass destruction as well as a missile program, to say nothing of the concern over its army with its huge artillery capability deployed not far from Seoul.

The efforts of these and other states do not reflect simple choices, dependent on single factors such as technology capability or costs. Rather, those decisions are as complex as the multiple capabilities they are trying to acquire. Although it is admittedly difficult to secure information regarding decision making processes in many countries, insights gained from looking at that process may open new policy approaches. It is particularly imperative because many of the states who are on virtually all the lists of suspected proliferators—Syria, Libya, and Iran for example—are also often on lists of states sponsoring terrorism.

At the sub-state level, a major question raised by the attack in Tokyo is why have terrorist groups not used such weapons before. Chemical weapons technology is more than eighty years old; modern biological weapons were first developed sixty years ago. As the Aum Shinrikyo demonstrated, the science involved in developing these capabilities is not beyond the grasp of many people with reasonable scientific backgrounds. The self-restraint that terrorist groups have shown is difficult to explain.

The fact that it was the Aum Shinrikyo in Japan that resorted to chemical weapons perhaps provides a clue. The Aum is not a group akin to those which emerged in the late 1960s and early 1970s, such as the IRA, the Basque separatists, or some of the militant Palestinian groups, who resorted to terror to achieve specific political objectives. These, groups used terror to attempt to move governments toward desired concrete actions. Their weapons of choice were those favored by terrorists throughout history—the gun and the bomb. An important part of their approach was to claim responsibility for particular incidents, sending the message that similar incidents would occur in the future if the desired action were not taken. The use of terror was often directed toward prompting such an excessive government response that it would alienate the general populations. With respect to these political terrorist groups, the question remains whether they are interested in exploring the chemical and biological weapons options. It should not be taken for granted that they are.

The Aum's action in Japan had none of these features. In not claiming responsibility for the subway tragedy, the attack was not tied to any government action or concrete objective. With no stated goal, the attack appeared more as an act of random violence than a political undertaking. In general, Aum Shinrikyo appears to have more in common with bizarre religious sects, only the Aum directed its violence outward toward society as well as inward toward members of the sect. The Aum Shinrikyo also seems to have combined its use of violence with activity resembling the workings of organized crime. A group such as the Aum, therefore, is something new, some kind of hybrid. The appearance of groups such as these—willing to use violence, including perhaps weapons of mass destruction, just to hurt society—complicates the ability of responsible officials to develop effective counters. It increases the burden on law enforcement and intelligence capabilities, which remain the foundation for dealing with terrorists, regardless of their weapon of choice. A critical first step is to learn better how such groups think and the factors involved in the decisions they make.

Fourth, not all members of the international community view the problem of technology diffusion through the same lenses. Some developing countries, for example, view nonproliferation efforts of the United States and other industrial nations as hypocritical, selective, and discriminatory. The traditional approach of technology denial through mechanisms such as the Australia Group and the Missile Technology Control Regime (MTCR) are especially resented.

Disputes over proliferation and how to balance the competing needs to protect and to share technology on a global basis have become a leitmotif of multilateral arms control. Major differences over technology are a theme in virtually every current or recent multilateral arms control effort, including the conference to decide on extension of the nuclear Nonproliferation Treaty (NPT), the work in The Hague on implementation of the Chemical Weapons Convention (CWC), and efforts to develop measures to bolster compliance with the Biological Weapons Convention (BWC).

These differences over technology are part of a broader challenge that makes it more difficult to deal with technology diffusion problems, raises the stakes regarding what is involved, and generates an urgency that cannot be ignored. A new tier of increasingly technologically-capable states has emerged. The fundamental challenge is to integrate this new tier of states into a global system that promotes stable regional and global security yet meets their growing insistence for a meaningful role in the evolving international system. What is at issue is no less than the distribution and exercise of global power into the foreseeable future.

If these states are denied, they can prompt enormous disruption in the security environment, impede important arms control progress, and exacerbate a festering sore created by profoundly different views over the appropriate distribution of power in the post-Cold War system. The challenge for the United States and its allies is not to give in to the demands of these states. Rather, the challenge is to recast the system in such a way that these states share—and see they share—a stake in it. If they do, then they can formulate their requirements in ways that will diminish proliferation pressures.

Finally, if this portrayal of the proliferation problem as a multifaceted challenge of technology diffusion is correct, no single solution to the problem will suffice. Rather, a multifaceted, integrated strategic response is required. Too often in the past, however, those responsible for different aspects of policy have worked in isolation from one another—arms controllers focused on negotiating and implementing agreements, export controls were applied by a different group, defense programs developed by yet another bureaucracy. An effective government mechanism to integrate the full range of policy tools, one that is sensitive to the balance that must be drawn among the use of different instruments, has not really existed.

INTEGRATING DIVERSE POLICY INSTRUMENTS

A number of tough questions exists, however, with respect to each policy element that should be incorporated into an integrated strategy. Answering these questions entails hard policy choices with significant ramifications. Highlighting some of those questions briefly include the following:

1. Intelligence

Effective intelligence is critical in countering proliferation successfully. It is also difficult. The U.S. government has made important progress in this area, through such measures as creation of the Nonproliferation Center at the Central Intelligence Agency. But the task remains daunting. The biggest intelligence coups related to biological weapons programs—for example, in Russia and Iraq—have been for the most part the result of defectors. As already mentioned, it is extremely difficult to get inside the decision making process of some countries of greatest proliferation concern and an even harder challenge when addressing sub-state groups. These are processes that do not lend themselves to examination through national technical means. What then are or should be our expectations regarding intelligence capabilities in this area? How should the traditional tension between investment in national technical means and investment in human intelligence capabilities be resolved in meeting the proliferation challenge?

Another issue not often examined is what intelligence demands are created when proliferation occurs? In such situations, what are the intelligence requirements to support implementation of other options? One example is the use of intelligence for target identification supporting the possible exercise of military power to take out a WMD facility. Do we today have the necessary capabilities, recognizing that during the war in the Gulf a number of Iraqi WMD facilities apparently were not identified?

2. Defense Programs

The impact of the proliferation of weapons of mass destruction can be diminished if effective defensive programs are developed. These programs have several dimensions:

Medical and scientific research must be supported to protect U.S. forces in the field with effective antidotes and vaccines. But, given limited resources, what balance should be drawn between working on traditional agents that are the most likely candidates for CW and BW weapons programs while hedging against surprise through examination of exotic, new agents? How far should U.S. work go in the examination of weapons effects, recognizing that such information also could be used, if it became publicly available, to support an offensive weapons program?

The question of protecting civil populations is also difficult. In the event of U.S. intervention into regions in which chemical or biological weapons could be used, what priority should be given to protecting civilians working in areas of military significance, such as ports, airfields, or logistics centers, that could be subject to WMD attack? Their vulnerability demonstrates that biological weapons in particular do not necessarily have to be massive in terms of casualties to be strategic in impact.

One issue raised by the Tokyo tragedy is civil preparedness against potential terrorist attack. To what extent should it be made a national priority? As an open society, the United States will never enjoy total invulnerability against those committed to making such attacks. But how can civil emergency preparedness be improved so that the consequences of an attack, should it occur, be minimized? Some municipalities have conducted exercises in responding to such scenarios to facilitate coordination of the law enforcement, medical, and other services that must be involved. Have those efforts been adequate across the country?

Another aspect of the defense program is military preparedness and the capability of U.S. forces to operate in a WMD environment. At the Global '95 wargame played in Newport this summer, biological and chemical weapons scenarios were the subject of significant play for the first time. According to published reports, the military's operational planning for such contingencies was found lacking. There were also media stories in June 1995 commenting on a Department of Defense report in which the detection, identification, and characterization of chemical and biological weapons was determined to be the greatest shortfall in U.S. military capabilities to counter weapons of mass destruction. Other shortfalls included robust passive defenses to enable continued operations in a WMD environment, including defense against cruise missiles, and theater missile defenses. The issue of defense against missile attack is one with which the Congress has struggled for some time. While controversial, exploration of the technical and political options should be continued.

These reports raise questions regarding the proper configuration and training of U.S. forces for possible operations in areas where proliferation has occurred. It also poses the question of acquisition priorities for such contingencies. The U.S. military has recognized the need to confront these tough choices, and all the services have initiated efforts to determine their future requirements.

3. Military Options

The use of military force in dealing with the problem of proliferation is also a controversial issue. If the goal of U.S. efforts, however, is to deter proliferation by raising the costs too high, by demonstrating that such efforts will not bring proliferators closer to their goals, or by denying them the ability to exercise the option even if they acquire it, then military capabilities must be part of the U.S. policy repertoire. Secretary of Defense Perry reportedly has given Special Operations Command the mission to develop preemptive ways to deal with chemical and biological attacks, but the exploration of options certainly will extend beyond this single organization.

4. Export Controls

Export controls have been a centerpiece of U.S. nonproliferation efforts. Their effectiveness, however, is of growing concern in light of the dual-use nature of much of the materials, technology, and equipment that now has relevance in the security arena. In a report for the Chemical and Biological Arms Control Institute, Brad Roberts of the Institute of Defense Analysis provides some striking statistics:

—The value of chemical exports from the developed world to the developing one increased from $33 billion to $57 billion between 1980 and 1991; materials controlled by the Australia Group constitute less than one percent of this amount.

—Annual direct investment in developing countries by U.S. chemical manufacturers doubled from $4.05 billion to $9.98 billion between 1983 and 1983.

—In the biological arena, the number of licenses for the export of microorganisms and toxins grew from 90 in 1991 to 531 in 1994 (while denials numbered one in 1991 and four in 1994).

—The Centers for Disease Control and Prevention shipped biological reagents to 41 mostly developing countries in 1994, up from 24 in 1991; every year virtually every country in the world receives shipments from the American Type Culture Collection covering a range of types of biologics but including pathogenic materials, presumably for medical diagnostic and treatment purposes related to controlling the outbreak of infectious diseases.

—One survey of the unconventional weapons programs of Iran, Syria, and Libya reveals that over 300 suppliers in 38 countries have provided them with dual-use items.

These trade and investment figures do not necessarily imply that recipients are pursuing weapons of mass destruction programs: They do suggest, however, that the dual-use nature of technology and materials relevant to proliferation of weapons of mass destruction are increasingly available if states make the decision to exploit them.

Another aspect of this issue relates to training. In the United States, a significant proportion of graduate students in the subspecialties of the natural sciences are non-American. Leaders of firms in the rapidly growing biotechnology sector point out they could not be competitive if they could not hire non-U.S. nationals. Most of these students and employees are pursuing their efforts for beneficial medical, scientific, or commercial purposes. Some of them, however, could return to their respective countries and turn their knowledge to more malevolent purposes.

The future utility of export controls, therefore, must be questioned in a world in which technological capability is so widespread. It has become fashionable in proliferation discussions to talk about "virtual nuclear powers," that is, states with the capability quickly to provide themselves with nuclear weapons should they make the decision to do so. The world is also replete with "virtual biological and chemical weapons states." Increasingly, the issue is not whether a state has the technological capability to provide itself with weapons of mass destruction, but whether it has the political will and makes the choice to do so.

5. Arms Control

Arms control treaties and agreements can make several contributions to the fight against proliferation:

- They establish global norms against which the behavior of states can be measured;

- They create important legal regimes criminalizing a range of behavior deemed unacceptable by the international community and providing a concrete basis for action against those involved in illicit activity.
- They represent levers to mobilize the international community in the face of potential threats; and
- They can reinforce deterrence by denying proliferators the benefits that might be derived from pursuing such a program or by forcing them along paths that are more difficult, more costly, more complex, and arguably more visible.

Arms control, however, as any other policy instrument, is not a panacea. As a product of hard-fought negotiations, an arms control agreement entails compromises among competing political objectives of the negotiating parties. As such, we should not expect arms control agreements to carry more of a burden than they were intended to bear. Arms control can reduce the scope of a potential problem, but it does not eliminate it. That is why it must be used in combination with other policy tools.

One aspect of arms control deserves special mention given its implications for the fight against proliferation. It has been an issue that the international community has traditionally avoided raising in polite company—that is, what to do in response to instances of noncompliance. In 1963, Dr. Fred Ikle wrote a classic article entitled "After Detection—What?" I expect Dr. Ikle is still looking for an answer. The issue of responding to noncompliance is one of the most politically contentious questions in the arms control arena. One need only remember the Russian violation of the ABM Treaty with the Krasnoyarsk radar or its noncompliance with the BWC as evidenced by the 1979 Sverdlovsk anthrax incident. These issues were almost as difficult political issues between Washington and its allies as they were with Moscow. Another example is the reluctance of the United Nations Security Council to act in the face of a clear violation by North Korea of its NPT obligations.

If the international community is unwilling to act in the face of violations of global norms embodied in international agreements, regardless of the elegance of their provisions, they are useless documents. More deliberate attention must be given, therefore, to appropriate responses to violations of arms control agreements before they occur—as we should expect they will.

Finally, an integrated strategy to meet the challenge of technology diffusion must involve a wider range of players than has heretofore been the case. Here, too, tough questions appear. For example, how do we arrive at common answers to these questions with other technology suppliers, both among our traditional allies and among the new suppliers? Can regions committed to their own end-use monitoring build new forms of trans-governmental and trans-business control mechanisms (eg., the European Union's license-free-zone concept)? Perhaps most important, how do we integrate into nonproliferation efforts the private sector which today is by far the most significant conduit for the global dissemination of technology? What ultimately is involved is a shift away from coordinated, but essentially unilateral strategy of technology denial to a genuine multilateral, and multifaceted strategy of technology management.

Clearly, there is a strong need for innovative thinking in order to fashion an effective approach to the problem of the diffusion of militarily-relevant technology. A process that challenges the conventional wisdom, that focuses on the gaps in thinking and policy, and that addresses these and other tough questions is essential.

Thank you.

Michael Moodie

Michael Moodie is President of the Chemical and Biological Arms Control Institute (CBACI), a nonprofit research organization established to promote the goals of arms control and nonproliferation. He brings to his leadership of the Institute more than twenty years of experience addressing international security issues in government, the policy research community, and academia.

In government, Mr. Moodie served from March 1990 to January 1993 as Assistant Director for Multilateral Affairs of the U.S. Arms Control and Disarmament Agency (ACDA) where he was responsible for such issues as chemical and biological weapons, conventional arms control, and confidence building measures, as well as U.S. policy relating to the arms control work of the Geneva-based Conference on Disarmament (CD) and the United Nations First Committee. Mr. Moodie was especially involved in the negotiations concluding the Chemical Weapons Convention for which his bureau was the interagency lead. Mr. Moodie was also involved in regional arms control, serving as Chairman of ACDA Coordinating Groups on Korea and Latin America, and as a member of similar groups on the Middle East and South Asia. He was also head of the U.S. delegation to both the 1991 Biological Weapons Convention Review Conference and the 1992 Review Conference of the Environmental Modification Convention.

From 1983 to 1987, Mr. Moodie served as Special Assistant to the Ambassador and Assistant for Special Projects at the U.S. Mission to NATO, where he concentrated on such issues as the NATO/Warsaw Pact conventional balance, conventional arms control, and alliance defense industrial cooperation.

In the policy research community, Mr. Moodie has held senior research positions at the Institute for Foreign Policy Analysis and the Center for Strategic and International Studies, where he was also Senior Advisor to the President. He has served as Visiting Professor at Georgetown University's School of Foreign Service and as a consultant to the President's Foreign Intelligence Advisory Board.

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THE ARENA

"It is not the critic that counts . . . The credit belongs to the man in the arena"—Theodore Roosevelt

RETHINKING EXPORT CONTROLS ON DUAL-USE MATERIALS AND TECHNOLOGIES: FROM TRADE RESTRAINTS TO TRADE ENABLERS

By Brad Roberts

Between rhetoric and disinterest lies an important story about the function of export controls on dual-use materials and technologies. The rhetoric is offered by the Non-Aligned Movement, which attacks such controls as contrary to the cooperative frameworks established in the global treaties—and as intended to keep undeveloped nations both weak and insecure. The disinterest is offered by western arms controllers, whose belief in supply-side control as an essential tool of nonproliferation leads them to pay little heed to the nonaligned view (or to uncomfortably and quietly accept it as on the mark). The reality of dual-use export controls is rather different from the picture painted by both camps. To understand their function clearly requires an appreciation both of the changing nature of the global economy and of the chaotic political forces unleashed in the international system by the end of the Cold War.

DUAL-USE CONTROLS

The structure of export controls on materials and technologies with both commercial applications and military utility in terms of the construction of weapons of mass destruction has grown quite elaborate over the last decade, as concerns about weapons proliferation have deepened. In the nuclear domain, export controls are cooperatively applied by the exporting states in support of the global control regime (the Nuclear Non-Proliferation Treaty [NPTI]); illicit diversion is monitored under the safeguards system as supplemented by national technical means. In the biological domain, trade in sensitive materials and technologies is monitored by the Australia Group in support of the global disarmament regime (the Biological and Toxin weapons Convention [BWCI]); efforts are currently underway to strengthen the verification and compliance components of this regime. In the chemical domain, the Australia Group plays the critical coordinating role in what its members define as a bridging function until the new Chemical weapons Convention (CWC) is fully and effectively implemented. Each treaty establishes as a principle that compliance will bring benefits of cooperation for peaceful purposes in the relevant materials and technologies. Outside of this regime encompassing these three treaties are other ad hoc export control mechanisms, such as the missile technology control regime and the nascent successor to the cold war-vintage CoCom (Coordinating Committee on Export Controls).

Over the last decade there has been a major effort among supplier states to tighten and otherwise improve these controls. The Australia Group itself was founded in 1985 in order to tighten national licensing procedures for export controls and to improve international coordination; its original focus on the precursors of chemical warfare agents expanded subsequently to include the technology of their production and then biological warfare materials and technologies.

The gist of the nonaligned critique is that the major states have excessively focused on the punitive functions of these regimes while ignoring their obligations to promote cooperation. They reject export controls as trade restraints and call instead for programs to subsidize technology transfer and cooperation. A few members of the Non-Aligned Movement have attempted to hold the process of strengthening and expanding the global treaty regime hostage to more substantial efforts by the developed states to implement the cooperative agenda. They reject the other ad hoc mechanisms as illegitimate because they are not founded on a globally negotiated bargain.

PATTERNS OF COOPERATION FOR PEACEFUL PURPOSES

Have export controls functioned to constrain trade and cooperation? A brief survey gives some basis for arriving at an answer.

In the nuclear domain, despite rigorous controls on both technologies and materials at a time of growing concern about nuclear proliferation—and a virtual abandonment of nuclear power as a source of power generation in the United States—international trade and cooperation have flourished. One indicator is the flow of nuclear dual-use technology from the United states: between 1985 and 1992, the United states issued 336,000 licenses for the export of nuclear-related dual-use items, valued at $264 billion.[1]

This trade is supplemented by various formal governmental programs to promote cooperation. In the case of the United States, these are numerous. The United States has agreements with EURATOM as well as 27 mostly developing countries to cooperate on deriving the benefits of nuclear energy in the fields of physical and chemical sciences, food and agriculture, industry and earth science, human health, radiation protection, nuclear power, safety of nuclear installations, nuclear fuel cycle, and radioactive waste management. It has supported over 2,500 specific technical cooperation projects. Between 1958 and 1989, the United States gave $79 million to the Technical Assistance and Cooperation Fund of the International Atomic Energy Agency (IAEA); from 1990 to 1994, it contributed an additional $60 million. Voluntary additional support to the IAEA in the form of extrabudgetary contributions has also regularly been provided by the United states and includes an annual series of training courses, the provision of cost4ree experts to the IAEA headquarters, and fellowships for foreign students and professionals to train in nuclear-related fields in the United States. Almost 4,000 foreign nationals from more than 80 other NPT countries received Ph.D. training in nuclear physics, nuclear chemistry, and nuclear engineering between 1974 and 1995. The United States also assists NPT parties in peaceful nuclear development by performing technical training missions overseas and hosting foreign visitors in the United States. Since 1986, 45,000 Department of Energy (DoE) specialists have performed technical assistance missions overseas while nearly 54,000 scientists and engineers from numerous developing countries party to the NPT have visited DoE facilities for training purposes.[2]

In the chemical domain, trade and cooperation are also extensive. In 1993, the global market for chemical and allied products totalled $1.26 trillion (in the U.S. economy, these products constitute the largest exporting sector). The value of exports of chemicals from the developed world to the developing one increased from $33 billion to $57 billion between 1980 and 1991.[3] Materials controlled by the Australia Group constitute less than one percent of this amount. Direct investment in developing countries by U.S. chemical manufacturers doubled from $4.05 billion to $9.98 billion between 1983 and 1993 (these are annual investments).[4] Furthermore, in the period of tightened controls by the Australia Group, the developing worlds share of the U.S. investment pie has not shrunk-investment in the developing world by U.S. chemical manufacturers remained a steady 21 percent of total U.S. industry investment between 1983 and 1993.[5] Formal government-to-government cooperative programs for the peaceful uses of chemicals have not been initiated, not least because their relevance in the face of this extensive global trade would be nil.

In the biological domain, patterns, are more difficult to discern. In the commercial area, trade and investment patterns vary among different sectors, with extensive international diversification of the pharmaceutical industry, a growing global market in the agricultural applications of biotechnology, and a capital intensive research and development effort with regard to biotechnologies generally.[6] In the governmental area, programs of collaboration on disease control are numerous. Extensive international collaboration on childhood vaccines has been undertaken under the aegis of the world Health Organization. The United Nations International Development Organization (UNIDO) helped to launch the International Center for Genetic Engineering and Biotechnology, an autonomous intergovernmental organization, to promote training in and the transfer of biotechnologies. The world Bank has created investment programs for agricultural applications in biotechnology, thereby facilitating the creation of specialist firms in many parts of the world. The U.S. Agency for International development sponsors basic research in biotechnology in foreign universities and elsewhere.

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[1] *Nuclear Nonproliferation: Export Licensing Procedures for Dual-Use Items Need to Be Strengthened,* GAO/NSIAD–94–119 (Washington, D.C.: General Accounting Office, April 1994).

[2] *Fact Sheet: The United States Commitment to the Nuclear Non-Proliferation Treaty, 1995* (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 1995). Data drawn from pp. 13–20.

[3] Figures in current year dollars. In constant dollars, with 1987 as base, the growth was from $42 billion to $47 billion. *United Nations Yearbook on International Trade Statistics, 1992, pp: S 50–53.*

[4] Figures provided by the U.S. Chemical Manufacturers Association, April 1995. Figures in current year dollars. In constant dollars, with 1987 as base, the growth was from $4.57 billion to $7.63 billion.

[5] Figures provided by the U.S. Chemical Manufacturers Association April 1995.

There is also a little noted—and growing—trade in biomedical applications. Microorganisms and toxins are exported by the United States (among others) and the number of licenses issued for the export such materials grew from 90 in 1991 to 531 in 1994 (license application denials numbered one in 1991 and 4 in 1994).[7] The Centers for Disease Control and Prevention shipped biological reagents to 41 mostly developing countries in 1994, up from 24 in 1991.[8] Every year virtually every country in the world receives shipments from the American Type Culture Collection covering a range of types of biologics but including pathogenic materials, presumably for medical diagnostic and treatment purposes related to controlling the outbreak of infectious diseases.

There are other indicators of the nature and extent of the international flow of dual-use materials and technologies. In 1991, the United States issued 38,000 dual-use export licenses; only a few hundred license applications were denied or not acted upon. In 1992, that figure dropped to 21,060, in large part because of a revision to U.S. export laws and a narrowing of the scope of restraint.[9] Another indicator is the success of key states of proliferation concern in tapping into the global dual-use market. One recent survey of the unconventional weapons programs of Iran, Syria, and Libya reveals that over 300 suppliers in 38 countries have provided dual-use items to them.[10]

To be sure, this data is incomplete. Its focus on U.S. industries and programs obscures the existence of numerous other sources of supply and cooperation. In the nuclear and chemical domains at least, non-U.S. sources are substantial. Moreover, the trade statistics are gross calculations and not always comparable across years or trade sectors. Further research would certainly cast far greater light on these patterns.

But the essential outlines are nonetheless clear. The global trade in dual-use materials and technologies is booming. So too is technology transfer through investment by developed countries in the developing world. The dual-use component has not been isolated from broader trends in the global economy of the last decade—an economy in which the volume of exports has grown at a rate twice that of cumulative GDP growth, while the volume of foreign direct investment has grown at a rate twice that of export growth. This growth of the dual-use sectors is striking-especially at a time of heightened proliferation concerns in the developed countries.

THE IMPACT OF CONTROLS

Thus the rhetoric of the nonaligned appears to be at odds with the facts. The pattern of extensive cooperation in the peaceful application of these items is undeniable. This pattern extends far beyond what governments alone might be capable of creating with aid programs or government-subsidized investment in technologies and materials of specific treaty relevance. And in a global economy of the type that has emerged over the last decade, with rapid growth in exports and investments, the foundations are being laid for future growth.

But what then are the utility of export controls? If technology is flowing so freely, do they have any utility at all? The classic case for export controls is that they retard weapons acquisition programs while also making them moire costly. They continue to serve this function even in a time of technology diffusion, although the time they buy and the costs they impose are shrinking. Reaping these benefits requires a broader international effort that integrates new sources of supply—as seen in the chemical and biological (and missile) area, but less so in the nuclear one.

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[6] U.S Congress, Office of Technology Assessment, Biotechnology in a Global Economy, OTA–BA–94 (Washington, D.C.: GPO, October 1991).

[7] U.S. Department of Commerce, Bureau of Export Administration, Special Licensing Division, April 13, 1995.

[8] Centers for Disease Control and Prevention, National Center for Infectious Diseases, March 29, 1995.

[9] U.S. Department of Commerce, Office of Export Enforcement, 1993.

[10] *Weapons of Mass Destruction: The Cases of Iran, Syria, and Libya,* a report of the Simon Wiesenthal Center, Los Angeles, Calif., August 1992.

But export controls take on new functions in the new global economy. In an economy in which industry and the firm are the primary conduits of trade and investment, such controls provide a way for industry to police itself. In an economy in which dual-use items are rapidly diffusing, such controls provide a way for states to maintain a degree of transparency in international exchange so that egregious misuses can be investigated, identified, and isolated. In an economy of multiple suppliers of sensitive technologies, they provide a way to balance competitive and cooperative interests of different states.

Put simply, the primary utility of export controls is trade enabling, not trade restricting. Their function is to create confidence among suppliers that recipients will use their acquisitions for peaceful permitted, not military, purposes. If they were to be with drawn, trade, investment, and cooperation would likely suffer. In the biological area, the coming boom in biotechnologies might be severely constrained by a loss of such confidence, as the industry is hemmed in by doubts about misuse in countries whose nonproliferation credentials are suspect. In the chemical area, trade and investment would be increasingly constrained by the kind of political pressure put on German industry in the wake of revelations about sales to the Libyan chemical warfare program. In the nuclear area, the passing of safeguards would cause a significant diminution in the international trade in sensitive items, and a curtailment of cooperative programs to all but a few key allies.

Some leaders of the nonaligned assert that the problem with export controls is not their restrictive character but their selective application. To be sure, the export controllers have not always been fair or effective. But statistics do not even support the case that export controls have kept all sensitive materials out of the hands of suspect proliferators. In the nuclear domain, during the period 1985 to 1992, the United States approved 54,862 licenses (worth $29 billion) for nuclear-related exports to 36 countries of proliferation concern, one-half of which went to 8 countries that have sought or are seeking nuclear weapons; of these, approximately 1,500 licenses were issued for exports to end-users involved in or suspected of being involved in nuclear weapons development or the manufacture of special nuclear materials.[11] This suggests that exports are being restricted only where their proliferation significance is clearly established (and perhaps not even consistently in those cases). It also illuminates the role of industry in helping to redress concerns about dual-use technology diversion. Backed by the U.S. legal system and intelligence-derived information, and infused with a nonproliferation ethic, U.S. industry plays an important role in making transparent technology usage even in countries of proliferation concern.

The fact that some developing countries are less successful in gaining access to international trade and investment flows may also have an explanation other the export control one. Some such countries are as isolated from the global economy as they are unaligned in the diplomatic community, and have failed to adopt the economic reforms that have opened others to foreign economic inputs. Chemical industry specialists report, for example, that the significant barriers to further investment in developing countries derive from the failure of some such countries to protect intellectual property rights and to remove other domestically created investment restrictions.

IMPLICATIONS

Four stand out.

First, the international debate on dual-use export controls needs a new foundation. Allies of effective control—and of broader international cooperation—do a disservice to their cause in leaving the debate about export controls to those nonaligned states that depict them in their most reprehensible form. The international political economy of the 1990s and the future is not the one that gave birth to the nonaligned worldview. Export controls can play a positive role—especially where they are essentially implementation mechanisms for the global treaty regime.

Second, in joining this debate, it is not good enough for the developed countries simply to state their bonafides or to tout the virtues of export controls as trade enablers. There is a political significance to the nonaligned critique that has gained momentum in the developing world. That critique now extends beyond export controls and the ad hoc coordinating mechanisms to the global treaty regime itself. Extension of the NPT was held up at least in part to Iran's success in gathering support for its view that Article IV has been inadequately implemented. Strengthening of the BWC through addition of a verification and compliance protocol is being held up at least in part by demand of the nonaligned, led again by Iran, for more substantial enforcement of Article X (the parallel to Article IV in the NPT). The effort to bring the CWC into force is also held hostage to those who prefer that the Australia Group cease to exist when the CWC enters into force, in contrast to the preference of Australia Group members that their harmonized controls of chemical precursors remain in place until the CWC is fully and effectively implemented. The debate over the purpose and utility of dual-use export controls—and thus over the criteria for participation in the various export control regimes—has held up the creation of the CoCom successor regime.

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[11] *Nuclear Nonproliferation: Export Licensing Procedures for Dual-Use Items Need to Be Strengthened*, GAO/NSIAD-94-119 (Washington, D.C.: General Accounting Office, April 1994).

In the face of this political agenda, to assert that export controls have positive and not negative value is not enough. The control community must deal better than it has with the charges of bias and ineptitude. It must make the case that such controls are fairly applied to block trade only to those with weapons programs or aspirations, and not simply to states out of favor with one or two powerful states in the international system.

Third, the dual-use export control debate should and can be an opportunity for deepening the patterns of political cooperation among states. Such patterns have grown very fluid with the passing of the Cold War. Coalitions are forged, wane, and are then remade along new lines as international exigencies require. The ad hoc export control coordinating mechanisms and the global treaties are tools for creating sustainable coalitions derived from globally embraced norms of state behavior. If this is a luxury created by the new political circumstance, it is a necessity born of the diffusion of dual-use materials and technology.

Yet this opportunity seems hardly noticed by the people interested in arms control and nonproliferation in the United States. The international export control debate has largely become a shouting match between the United States and Iran, from which others seek to distance themselves. Sharp emotions distract attention from the important lesson for the United States in sustaining effective export controls. It is no longer leader of a cold war coalition against the Evil Empire, but first among equals in a globalizing economy and an unstable international political order, where the exigencies of multilateral diplomacy are borne uncomfortably by a United States that finds them unfamiliar and discomfiting. When individual states are consistently targeted for selective denial, there is a political requirement to make a public case for such treatment that withstands international scrutiny.

A fourth implication is for arms control. Although a post<old war agenda has yet to come into clear focus, future tasks can be discerned in the patterns of economic, technological, and political activities described here. Whether or not weapons proliferate will turn increasingly on political decisions shaped by a wide variety of factors-domestic, regional, and global-to turn weapons potential into weapons prowess, not simply on decisions to acquire weapons potential. This points to the growing importance of the NPT, BWC, and CWC as embodiments of internationally agreed norms and as mechanisms for marshalling coalitions to meet the challenges of states not party to those norms. Their importance derives also from what U.S. participation in them implies about U.S. engagement in cooperative strategies in its unipolar moment.

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Brad Roberts is editor of *The Washington Quarterly* and chairman of the CBACI research advisory council.

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If you have ideas for future issue papers or questions about points raised in this paper or relating to arms control and proliferation in general, contact the Institute by phone at (703) 739–1538, or send a fax to (703) 739–1525.

Michael L. Moodie, Executive Editor
Geoffrey W. Nagler, Managing Editor

Senator NUNN. Thank you very much, Mr. Moodie.

I am going to make my questions short. We have a lot of questions we would like to ask this panel but we have another panel and we have a target of trying to get through here by 12 to 12:30, so I am going to make my questions short and then rotate it.

Dr. Mirzayanov, could you tell us more about the case of General Kuntsevich, who was a former member of President Yeltsin's Committee on chemical weapons and who, I understand, was recently indicted by the Russians for smuggling chemical weapons to the Middle East? Could you tell us what you know about that?

Dr. MIRZAYANOV. [Translated from Russian.] I can say that on April 4, 1994, the KGB had started an investigation on General Kuntsevich and a group of researchers, including Mr. Petrunin, Director of GosNIIOKhT, and Mr. Drozd. On April 6, already, General Kuntsevich was dismissed from his post, but the main problem is that all those people were only witnesses in the case. The investigation was especially interested in Mr. Drozd confirming the allegation that along with laboratory equipment, a precursor was also sent to Syria.

My opinion is that part of it is true but part of it is a political game. During this last year, bosses of General Kuntsevich were not satisfied with the way he handled his job. This is especially true of General Petrov and his assistant, General Yevstafyev, who thought that Kuntsevich was paying too much attention to the process of destruction of chemical weapons and was not too much worried about saving the potential of Russia.

My opinion is that General Kuntsevich is not the worst among the generals in the chemical forces of Russia, but to a certain extent, he is not quite sincere. He is not a sincere person.

I think that part of this truth that the investigation already knows is enough to take more severe measures towards General Kuntsevich.

I must say that General Kuntsevich did not act on his own. No doubt that he was in agreement, he acted in consent with his superiors. In particular, cooperation with Syria was not the initiative of Kuntsevich. He was only told to do this.

This is why I think that, at the moment, someone has just decided to sacrifice Kuntsevich for the sake of some political goals.

Senator NUNN. Let me ask you this question, if I could, because I want to be able to rotate it. Some people would cite, including some in the Congress, some outside, would cite this example of a person very high up, a senior general now being indicted for selling those weapons, cite that as evidence that we are not able to enter into a chemical weapons agreement with Russia and other countries because of corruption and because of that kind of a breach of trust. How would you respond to that?

Dr. MIRZAYANOV. [Translated from Russian.] I would answer to this that certainly those generals who have initiated this whole case are strongly against chemical disarmament. But the Chemical Weapons Convention is a product of 20 years of hard work of many researchers, politicians in many countries. So any negative impulse, any negative effect on this process of ratification would make Russia even more non-transparent in the sense of chemical weapons and we would return to the starting point.

Mr. MOODIE. Mr. Chairman, could I make a comment on your question?

Senator NUNN. Yes.

Mr. MOODIE. Two quick points. First, one of the reasons that some Senators are concerned about the CWC in relation to General Kuntsevich is that they have described him as a "key negotiator" of the Convention. When I was at ACDA, my bureau had responsibility for the interagency leadership on the CWC negotiations, so I had to follow those talks very closely and spend some time in Geneva at the talks.

It is my recollection, it is the recollection of some of the people in the U.S. delegation, and it is the recollection of the head of the Russian delegation to the talks that General Kuntsevich may have come to Geneva for 1 or 2 days, but he never was involved in the negotiations at the table.

The second point I would make is that until the CWC enters into force, there is no legal international law against trade in these materials. The only international legal prohibition on chemical weapons is the 1925 Geneva Protocol, which bans use of CW. All the other aspects—production, development, research, trade—there is no prohibition against those. So if he was in violation of anything, it would have been in violation of Russian domestic law and the CWC does provide some measures to strengthen that area, as well.

Senator NUNN. Thank you.

The final question I have, Dr. Mirzayanov, to your knowledge, were chemical weapons ever sent by the Soviet government to the Middle East?

Dr. MIRZAYANOV. [Translated from Russian.] Yes, I am aware of testimony of one of the colonels who participated in transportation of modern chemical weapons to the Middle East in the former Soviet Union.

Senator NUNN. What country? To what country did those weapons go?

Dr. MIRZAYANOV. [Translated from Russian.] He did not say. He did not name the country, but we can take a guess. What he was saying is that those chemical weapons were not meant for use in only one country, but including Syria.

Senator NUNN. Was that during the days of the Soviet Union or has that kind of shipment continued under Russia?

Dr. MIRZAYANOV. [Translated from Russian.] No, this took place in the Soviet days and this colonel was ready to go public in a situation that would become critical for him.

Senator NUNN. Did he go public?

Dr. MIRZAYANOV. [Translated from Russian.] No, he did not. He did not go public because the current Russian laws and the absence of a ratified Convention on chemical weapons do not inspire people to go public with revelations of this sort.

Senator NUNN. Thank you.

Senator Cohen?

Senator COHEN. Thank you, Senator Nunn.

Dr. Mirzayanov, there are some ironies in what you have been testifying to here today. No. 1, you have indicated that the chemical weapons developed by the Soviet and Russian governments are hermetically sealed so they are very safe. One would hope that the craftsmanship that has been dedicated to Russian military weaponry is superior to that in the commercial sector, such as Chernobyl, in terms of protecting the public against leakage of materials. We assume that to be the case.

The system of protection for these hermetically-sealed weapons was always that of personnel. You had many armed personnel that were stationed to protect their being stolen or used for other purposes. Now we have the situation in which the personnel are no longer there or, in many cases, have been corrupted, either by those seeking to purchase some of these materials or by organized crime.

We have heard nothing here today about the role of Russian organized criminal gangs. We have had other testimony in other settings that there may be as many as 5,500 gangs operating in Russia, even in Moscow. They have been successful in many respects in penetrating both the military and the government officials through corruption.

None of our witnesses have addressed themselves to that issue and perhaps you could enlighten us as to whether, from your experience, you know whether organized crime is actively seeking to gain access to such materials.

Dr. MIRZAYANOV. [Translated from Russian.] I would like to say that I agree with you completely that chemical weapons in Russia face tremendous danger of theft, both from personnel and from organized crime. To my mind, we are just simply lucky that this has not happened yet. We are just fortunate, because nobody has yet ordered for such theft to take place. I think if someone has an order to get these chemical weapons, there will not be many problems of getting them.

Senator COHEN. Could you tell us whether or not the Russians are prepared or were prepared to violate the Chemical Weapons Convention upon its ratification? In other words, were steps being taken to surreptitiously violate the treaty, assuming that it is ratified?

Dr. MIRZAYANOV. [Translated from Russian.] To my mind, the Chemical Weapons Convention is created in such a way that any potential violations can be overturned. I have indicated in my articles that the lists of chemical agents that are being controlled do not include some of the agents that are being developed. This was my main concern. That is why I went public in my articles before, when the process of ratification started. But after my articles and after a number of consultations with my fellow researchers, I have come to the conclusion that all these types of agents can be controlled under the Chemical Weapons Convention.

Senator COHEN. Let me express a personal opinion here at this time. I think there is no treaty that can be drafted that cannot be circumvented by any country that is dedicated to doing so. It is my personal belief that the Russian government was undertaking activities to prepare for the circumvention of the Chemical Weapons Convention, as they did for the Biological Weapons Convention.

That is a personal judgment on my part. It does not mean we should not have such conventions, but that is an issue that we have to address. I know that Senator Nunn is anxious to move on quickly, but just let me make a couple of quick points.

I think in your statement, Dr. Leitenberg, you pointed out the issue of the trilateral countries saying that they have confirmed the termination of offensive research and dismantlement of experimental technological lines for production of agents, etc. That may be true, but, in fact, we know that the Russians lied in the past about Krasnoyarsk for years. Do you recall this? We maintained that they were building an ABM battle management station in violation of the ABM Treaty. They said, no, we are building it for tracking satellites. It took years of pressure until they finally yielded the truth that they were, in fact, building it in violation of the treaty.

They lied for years. Mr. Gorbachev, the architect of glasnost, lied about their biological weapons activities for years. Finally, when President Yeltsin came to the United States, he admitted that they, in fact, had a biological weapons program.

So there is a history behind this. The question is, why should we believe them now? I would come back to what President Reagan said. We must trust, but verify. So the verification regime is going to be the most extensive and the most intense that we can call upon.

But I want to say something else, one final point, Senator Nunn and others, if you would permit me just to comment briefly on a subject matter that is in the news today. One of the lead stories in both *The New York Times* and *The Washington Post*, and I assume every other major paper, deals with the CIA and the issue about the contamination of intelligence that was given to our policy makers. Great criticism is being directed toward the CIA at this time.

The American people ought to know also that it is an institution filled with human beings with human failures, but there are great successes that are being achieved even as we speak which will never be told and cannot be told. Successes cannot be discussed in public, but there are many successes underway in the field of human intelligence.

It is true that, on the one hand, we need this extraordinary technological capability for verification, but we also need human intelligence. And many times, success results not just because of the scientists in the labs but also operatives in the field, in that very dark and dangerous world of espionage.

So I think that story has to be told, as well, because I think that people are getting the impression that the United States intelligence agencies, and the CIA in particular, have done nothing but misuse their powers and are filled with individuals who cannot perform up to standards of excellence that we demand. They do outstanding work, notwithstanding the failures that we are all reading about.

I think that has to be said because to verify treaty compliance in the field of biological weapons and chemical weapons we are going to have to rely upon human intelligence, as well as all of the scientific equipment that we can develop and deploy.

Thank you, Mr. Chairman.

Senator NUNN. Thank you, Senator Cohen.

I would subscribe to that statement. The mistakes of the CIA are going to have to be rectified. There is going to have to be some house cleaning and there is going to have to be some restructuring. There is going to have to be a modernization. The missions are going to have to be reexamined, all of that, but we are going to continue to need the best intelligence that we can possibly gather.

The world today is not as high-risk as it was. There is not as much high risk of a nuclear confrontation, but there is also less stability than we had during the Cold War and more dangers of proliferation by far and even more dangers of the use of a weapon of mass destruction than there was during the Cold War, so we all have to put that in perspective.

I might also say the same thing about our domestic law enforcement. The FBI is going to have to correct a lot of the mistakes that were made, Waco and other places, but if you look at the number of terrorist incidents we have had in this country compared to the number we could have had over the last 10 or 15 years, I think there are some real success stories that, again, have not, as Senator Cohen has said, been told, that those of us dealing with this are familiar with.

One success story that has been told now is the fact that our intelligence community kept insisting that Iraq was not coming clean during these U.N. inspections. As we have heard one of our witnesses say today—I believe it was Mr. Leitenberg—it would have been a disaster had we lifted the sanctions while they were still lying in Iraq about their BW program and about their chemical and about some of their nuclear programs. So that is one that you have to chalk up on the plus side.

Let me again rotate over to Senator Lugar.

Senator LUGAR. Thank you very much, Senator Nunn.

Mr. Moodie, I have just a short question but it deals with your thought that proliferation of both technology as well as materials may occur and is non-stoppable. The point you have made is that our mission really is, as you said, the channeling of choices of those leaders to whom such technology is increasingly available.

In other words, given the fact that these instruments of destruction will come into the hands of various countries, or sub-state groups or even religious cults, our challenge is trying to determine how we channel or frame the decisions of leaders possessing such destructive means. Why do groups such as this think as they do? Why does somebody want to destroy a society without having a political objective?

Can you sketch out how you do this? In other words, what instruments do we need in policy making, so that the President, Cabinet officials, the CIA and so forth may begin to think through how to channel those decision-making processes? What institutional changes are implied by this?

Mr. MOODIE. Thank you, Mr. Chairman. I wish I had all day.

I think the first point is that no single instrument is going to do it. You have to make everything work together towards the same objective—having an impact on the decision making that is involved in choices to go for weapons of mass destruction.

At the government level, I think what you have to do is raise the costs as high as you can through both international and national activities. You have to demonstrate that the weapons of mass destruction program that a state might embark upon is not going to get it to the point that it wants to go, that you can deny it its objectives regardless of whether it acquires weapons of mass destruction.

You raise the cost too high, which is why, although I have some problems with export controls as the centerpiece of our strategy, I do not think you should throw them out entirely because I think they help raise the costs.

I think that you demonstrate that proliferators are going to be severely punished if they, in fact, violate the kinds of international norms that people are trying to enshrine in things like the Chemical Weapons Convention, the Biological Weapons Convention. That means, in my view—I did not mention it in my oral statement, but in my written remarks—that we have to consider what kinds of military options should be part of our policy repertoire to raise the costs, in fact, to channel their choices away from this option, basically because they are not going to get what they want to get by the use of these kinds of instruments of violence.

You incorporate a diplomatic effort. You have to create an international norm embodied in legal agreements like the CWC, the BWC. You have to have export controls. You have to have diplomatic activities. You have to have defense capabilities so that proliferators will be denied the fruits in the event that they want to use them against, say, U.S. interventionary forces. We must have an adequate defense so that they are denied that objective through the use of these programs. It is only by this kind of integrated approach that you are going to get to the point where you want to be.

Senator LUGAR. Is this likely to be ultimately effective if we take a position that essentially all of these sanctions have to be multilateral, or should we make clear that some situations are serious enough that we are prepared to act unilaterally to deal with such violations? I raise this question because I tend to come down on that side.

If we are to channel the decisions of would-be proliferators, our credibility comes down to the fact that the U.S. is prepared to use military force, export controls, and other instruments to ensure that proliferators are severely punished—in other words, land on top of them with a ton of bricks so that there is no ambiguity. Absent that, we will remain in a debate, even with good friends like the British, the French, the Germans, the Japanese, as to whether, collectively, we are prepared to do this and who should do what and so forth. I do not think that gets the job done, if I follow your logic.

Mr. MOODIE. I think you have to do both, in the sense that ultimately it has got to be the psychological orientation of the entire international community that helps channel these choices away from proliferation. That means getting more states willing to take this problem seriously.

One of the points I tried to raise was that there are a number of countries in the world that do not see the issue quite the way we do and would handle it differently. They view the MTCR, the Australia Group, as hypocritical. These states are not just the radicals in Iran but others. These export control regimes are seen as discriminatory. They are seen as an economic ploy, in essence, to keep the underdeveloped countries down while the industrialized world goes ahead with the benefits of things that we are denying them.

There is a psychology there that has to be addressed seriously so that countries can follow the lead of a country like Argentina, which has changed significantly its attitude towards international proliferation issues and the protection of technology in the last 4 or 5 years.

So part of it has to be a multilateral agreement because some of the tools we have available are not going to work unless they are multilaterally imposed. Sanctions, I think, is a good example. We can impose sanctions unilaterally. If others do not, they are going to have no impact whatsoever.

At the same time, I think we also have to demonstrate that in some situations where it is appropriate, we are willing to take action ourselves. I am not advocating that we conduct a series of U.S. "Osiraq reactor" raids of the kind the Israelis did, but it is not something that we should dismiss out of hand, either, for every situation. It should be part of our policy options, our contingencies, and we have to continue to explore what the best kinds of activities are that will help us in that area.

So I do not think it is an either/or choice. I think we are going to have to work aggressively in both areas.

Senator LUGAR. Thank you.

Senator NUNN. I believe Mr. Leitenberg wanted to respond to that, also.

Mr. LEITENBERG. I wanted to comment on two points, and to Senator Cohen. In Mike Moodie's original statement he talked about what to do when we know about noncompliance. I think unilateral sanctions are much more important than we usually give them credit for. Regarding the statement that they are not effective unless everybody else joins in; you cannot get them to be effective unless you start them.

Back in the late 1970s, when the United States convened the London Suppliers Group on nuclear problems and we were fiercely battling the French regarding their reactor sales to Pakistan and the Germans regarding their reactor sales to Brazil, all of that would never have succeeded unless the Carter administration had not made certain domestic decisions: to cancel the Clinch River Breeder reactor, to cancel plutonium reprocessing. It would have been diplomatically inconceivable to apply the pressure on countries with the economic potential of France and Germany, which had their own notions about the desirability of reactor sales, unless we had shown that we were ready to put something of our own on the line.

I think much more has to be done in the circumstances when we know that there is a treaty violator. We have said in noncompliance statements that some of the nations with BW programs are signatories of the treaty. They have not ratified, but they have signed it, we believe they are violating its provisions, but nothing is done. There is no penalty, and there has to be a penalty.

I would like to comment on Senator Cohen's statement. When the IAEA was embarrassed to discover that Iraq had violated the IREA nuclear safeguards also, nobody thought that those safeguards should be abolished. We never can say, "you are going to be 1,000 percent certain that you are going to find every violation." But if the problem is that big, the regime hopefully will deal with 95 percent of it, at least. But without that, there is no handle at all. We would not get those Russian admissions of those past lies if there was not that trilateral process——

Senator COHEN. Or present lies.

Mr. LEITENBERG [continuing]. If there was not some way of getting into the Russian laboratories and getting a handle on the situation.

Yesterday you asked a very important question which I would like to be able to answer: The question was not addressed to the right group yesterday. You referred to the instance at the recent meeting in London, the anthrax meeting where the Russians had come forward and said they had put in the genetic markers for antibiotic resistance. You were rather astonished that they admitted it.

Well, we have been pressuring them for 3 years to admit to things like that. We have been very, very persistent because under the CBMs of the Biological Weapons Convention there is a thing called the Form F submission, in which they were supposed to report on all their past offensive BW programs back to 1945, and they did not. And we have been repeating that they did not. So we want them to admit to those things. That is the first point.

The second is that under our own definitions of what is permitted under defensive research—and the Russians are permitted a defensive program, we have a defensive program, the British do, the Swedes do, the Dutch do—that gets very, very difficult. Because we have defined the permissibility of defensive research in a very maximalist way, that we can look at any potential threat, develop it in the laboratory, and be able to test against it. By our own definition, therefore, that would definitely be permitted under a defensive research program.

The third point is that they probably did that back in 1985 or 1986. It is not likely that they did it since 1992, since the trilateral statement. They probably did that in the mid-1980s, or at least we think so.

Senator COHEN. Thank you.

Senator NUNN. Senator Cochran?

Senator COCHRAN. Mr. Chairman, thank you very much.

I was thinking as I was reading your statements and listening to the testimony and questions about the unfortunate experience that we had when the Chernobyl accident occurred. We were fearing the intentional use of nuclear power as a threat to the security of the United States and then we found out from that experience that a nuclear accident anywhere can be a nuclear accident everywhere and can affect the well-being of people all around the world.

I wonder if that is a similar concern in the biological and chemical weapons area. Given the signing of these Conventions, is it enough just to sign the Conventions or should we insist, or is it a provision in the Convention that these stockpiles should be destroyed, should be done away with?

I know when we were negotiating with the Soviet Union on the subject of chemical weapons banning, the question came up. Do we continue to produce chemical weapons and stockpile them in Arkansas or wherever we had them, or should we begin a unilateral program along with that to show good faith that we are not going to produce these weapons? They are inherently dangerous and we are not going to ever use them. Why produce them?

Is it a part of the regime, or should it be, that these stockpiles should be done away with, and how do we go about achieving that goal? I ask that question to everyone. Ms. Smithson?

Ms. SMITHSON. Thank you. We have already stopped our production programs unilaterally. We have also unilaterally begun to destroy our chemical weapons stockpile. The Chemical Weapons Convention requires that states possessing these weapons destroy them within a 10-year time frame.

In the case of Russia, I think that everyone recognizes that economic circumstances there will make it very difficult for them to meet this deadline, and we have begun offering them assistance in destroying their stockpile. Russia can request a 5-year maximum extension of this deadline. Thus, the Convention does include a requirement for states around the world to begin destroying these stockpiles.

Senator COHEN. Mr. Leitenberg?

Mr. LEITENBERG. The answer is the same. We have no “B” stockpile. We do not think any other Western country does. In fact, my understanding is that the U.S. Government does not think that anyone is presently—any of those nations it talks about as having BW programs—that none of them are presently producing “B” agents. I understand that is the Government's assessment.

So there may be no stockpiles in this case, and under the memorandum of understanding in 1989 between the United States and the former Soviet Union and transferred to Russia, there was the agreement to destroy bilaterally our stockpile and theirs and that was transferred to the Chemical Weapons Convention.

Senator COHEN. Thank you, Mr. Chairman.

Senator NUNN. Thank you, Senator Cochran.

Senator Cohen, do you have any other questions?

Senator COHEN. Just one other question. Doctor, Senator Nunn had indicated that the Russians had transferred some chemical weapons to Syria and possibly other nations. Could you tell us if you know in what amounts, how much was transferred and when?

Dr. MIRZAYANOV. [Translated from Russian.] Unfortunately, I am not aware, not only me, but my colleagues, as well, are not aware of the details and this aspect still needs to be worked on.

Senator NUNN. I want to thank all of our panel, Mr. Moodie, Mr. Leitenberg, Ms. Smithson, Dr. Mirzayanov. We appreciate very much you being here. This Subcommittee is going to continue our focus in this area for some time to come. We think it is one of the most important national security problems we face and I know all of you, by your own priorities in life, agree that it is a very important matter. We look forward to continuing to receive the benefit of your research and your wisdom and your views. Thank you very much.

Our next panel, if I could ask all the panel members to come up, includes Dr. Gordon Oehler, Director, Nonproliferation Center, Central Intelligence Agency; Ms. Connie Fenchel, Director, Strategic Investigations Division, Office of Operations of the U.S. Customs Service; John O'Neill, Chief of the Counterterrorism Section, Federal Bureau of Investigation; H. Allen Holmes, Assistant Secretary of Defense, Special Operations and Low Intensity Conflict, U.S. Department of Defense, and Dr. Frank E. Young, Director, Office of Emergency Preparedness, Public Health Service.

Before all of you get comfortable and settle down, we swear in all the witnesses before the Subcommittee, so if each of the witnesses could please hold up your right hand and we will swear all of you in.

Do you swear the testimony you give before the Subcommittee will be the truth, the whole truth, and nothing but the truth, so help you, God?

Mr. OEHLER. I do.

Ms. FENCHEL. I do.

Mr. O'NEILL. I do.

Mr. HOLMES. I do.

Dr. YOUNG. I do.

Senator NUNN. Thank you. Please have a seat.

Dr. Oehler, I believe we will start with you and just work our way from left to right down the table. We welcome your statements today and we will introduce your entire statement in the record. I would encourage our witnesses to summarize in about 10 minutes, if you can do that. We do not want to leave out any important points but we would like to have some time for questions.

Dr. Oehler?

TESTIMONY OF GORDON C. OEHLER, DIRECTOR, NONPROLIFERATION CENTER, CENTRAL INTELLIGENCE AGENCY

Mr. OEHLER. Thank you, Senator. I thank you for the invitation to be here today, as well, and I would like to thank Senator Cohen and Senator Nunn for their kind remarks about the work that the CIA does do that is done well. We deserve criticism where we make mistakes but I think we also deserve some credit where we do things right, and I thank you very much for those comments.

I certainly do not need to convince this group of the importance of weapons of mass destruction and what they can do to civilizations around the world. Currently, we have pointed out that there are some 20 countries, nearly half of them in the Middle East, that have weapons of mass destruction of one type or another or are trying to develop them.

As you have heard in some of your briefings, the technologies associated with chemical and biological weapons have legitimate civilian and military applications, and while we attempt to restrict trade in these goods and technologies, obviously all trade cannot be banned. Thus, countries wanting to develop chemical and biological weapons mask acquisitions as part of legitimate business transactions.

Much of our attention in the past has been focused on state-sponsored military programs, and as recent revelations from Iraq show, this attention has not been misplaced. The unprecedented inspections conducted in Iraq by the United Nations revealed much about Iraq's weapons of mass destruction program and underscores the complexity faced by international efforts to curb the spread of these weapons.

In the wake of the recent defection of two high-level Iraqis, the Baghdad government turned over to the United Nations Special Commission, the UNSCOM, and the International Atomic Energy Agency a large cache of weapons of mass destruction-related documents and they have revealed even more information in extensive discussions with both U.N. organizations.

These revelations underscore our longstanding judgment that the Iraqis have made efforts to deceive the UNSCOM and the IAEA. This resulted in UNSCOM Chairman Rolf Ekeus's delivery of a strongly-worded report to the U.N. Security Council several weeks ago critical of Iraq's progress in fulfilling its obligations to come clean.

The recent declarations show the mind-boggling scale of Iraq's chemical and biological weapons program. For example, in the area of chemical warfare, in addition to the 150 tons of nerve agent sarin and 411 tons of the blister agent mustard that they declared earlier, the Iraqis finally admitted to an extensive program to develop the more toxic and more persistent nerve agent VX. They admitted to producing 65 tons of chlorine intended for the production of VX and to more than 200 tons each of two controlled precursors. Together, these would have been sufficient to produce almost 500 tons of VX. I would like to point out that only 10 milligrams are needed for a lethal dose.

Iraq developed a true binary sarin-filled artillery shell, 122-millimeter rockets, and aerial bombs in quantities beyond prototype level. They admitted that they flight tested a long-range variant of the scud missile with a chemical warhead in April 1990.

If it is possible, the declarations concerning their BW program are even more terrifying. According to their oral declarations made since mid-August, a total of 6,000 liters of concentrated botulinum toxin and 8,400 liters of anthrax were produced at the Al Hakam facility during 1990. An additional 5,400 liters of concentrated botulinum toxin were produced at the Daura Foot and Mouth Disease Institute during the period November 1990 to January 15, 1991. Four hundred liters of concentrated botulinum toxin were produced at Taji and 150 liters of concentrated anthrax were produced at Salman Pak.

Continuing, they produced, as they say, 340 liters of concentrated clostridium perfringens, which is a biological agent that causes gas gangrene. They said that they had static field tests of anthrax simulant and botulinum toxin conducted using aerial bombs as early as March 1988. Animals were used as test subjects and they had live firings of 122-millimeter rockets filled with BW agents conducted in May of 1990.

Large-scale weaponization of BW agents began in December of 1990. Iraq declared that they filled more than 150 bombs and 50 warheads with agents. All of these weapons were dispersed to forward storage locations during the Gulf War.

And finally, Iraq worked to adopt a modified cargo aircraft with a drop tank for biological agent spray during operations beginning in December 1990. The tank could be attached either to a piloted fighter or to remotely-piloted aircraft. It was designed to spray up to 2,000 liters of anthrax on a target. While the Iraqis claim the test was a failure, they noted that there were three additional drop tanks modified and stored, probably ready for use.

Iraq is certainly not our only concern. Iran's chemical weapons buildup, for example, runs contrary to the image it is trying to present in the disarmament arena. Even after signing the CWC in January 1993, Tehran continues to upgrade and expand its chemical weapons production infrastructure and chemical munitions arsenal. Iran is spending large sums of money on long-term capital improvements to its chemical weapons program as part of this expansion, and this tells us that Tehran fully intends to maintain a chemical weapons capability well into the foreseeable future.

As further evidence of Iran's intention, Tehran is continuing its drive begun during the Iran-Iraq War to acquire increasingly toxic nerve agents and soon should have a production capability for these agents, as well. It is also developing a production capability for the precursor chemicals to alleviate the need to import restricted raw materials.

As I noted earlier, much of our attention in the past had been focused on military programs. We are beginning to see that the use of weapons of mass destruction is no longer restricted to the battlefield. Terrorist groups are showing an increased interest in using these chemical agents to kill their opponents.

For example, Tajik opposition members laced champagne with cyanide at last year's New Year's celebration, killing six Russian soldiers and the wife of another and sickening several others. Press reports of the PKK, the Kurdistan Workers' Party, in Southeast Turkey poisoned Turkish water supplies with cyanide.

But as has been discussed at length in your hearings, the attacks by the Japanese cult Aum Shinrikyo really brought this trend to the front pages. The attacks in Matsumoto, Japan, in June of 1994 and Tokyo in March, as you know, killed a total of 19 people and injured more than 5,500.

The forthcoming trial of Aum Shinrikyo's leader, Shoko Asahara, has resulted in a number of revelations about the cult's activities. The press reports state that in 1993, Asahara ordered his followers to pursue a capability to produce sarin. The large, agent production facility which resulted from that order was operational in about March of 1994.

You have heard of the evidence of possible testing of sarin on sheep in Australia. Aum Shinrikyo planned to produce enough chemical agent to annihilate a large Japanese city by spraying it from a helicopter. Aum Shinrikyo had purchased a Russian helicopter and two drones that, with modifications, could have been capable of delivering these chemical or biological weapons.

Japanese authorities have determined that Aum Shinrikyo was working on developing the chemical agent VX in addition to the sarin used in the subway attack. And again, if that were not enough, Aum Shinrikyo was working on biological agents, as well. Press reports allege that atomizers were found at the cult's Mount Fuji compound that were intended to spread botulinum toxin.

Testimony by Aum Shinrikyo followers state that in June 1993, senior Aum leaders released anthrax from the top of a building in Tokyo. Some local residents complained of a bad smell over a 4-day period around the attack and reported it to the police.

Aum Shinrikyo was able to legitimately buy all of the components that it needed to build its chemical and biological infrastructures. The technical know-how to put the pieces together is available through open-source literature, including over the Internet.

Terrorists' interest in chemical and biological weapons really is not surprising, given the relative ease with which these chemicals can be produced in simple laboratories. The large numbers of casualties they can cause is of interest to some of the new terrorist groups, and, of course, they have great interest in residual disruption of infrastructures, as we have seen with other terrorist acts. Although popular fiction and national attention have focused on terrorist use of nuclear weapons, chemical and biological weapons are more likely choices for these groups.

Stopping the spread of weapons of mass destruction can only be accomplished through international cooperation, and several international organizations have been established or are in the process of being established for just this purpose. You are familiar with them. There is the Treaty on Nonproliferation of Nuclear Weapons which just passed the indefinite extension here this year; the CWC, which you have discussed at length; the Biological Weapons Convention; the Australia Group, which restricts the flow of chemical weapons and biological weapons materials and production technologies; and the Missile Technology Control Regime for hindering the development of ballistic missiles of proliferation concern.

The U.S. intelligence community, participating with other Government agencies, is waging an aggressive campaign to curb the spread of these weapons of mass destruction. These efforts encompass developing new technologies to detect research and development, testing, production, weaponization, and deployment and use of chemical and biological weapons. We are developing a list of collection indicators to alert policy makers to possible impending use of chemical and biological weapons and we are working with U.S. law enforcement agencies to try to minimize the threat to U.S. interests.

In sum, the revelations from Iraq verifying the horrendous extent of CW and BW programs and the actual terrorist use in Japan should serve as a wake-up call to all governments of the world. Preventing the use of weapons of mass destruction by terrorist groups and the development of military capabilities in third world countries will require both a careful internal scrutiny by all countries and an aggressive and cooperative international effort. Thank you.

[The prepared statement of Mr. Oehler follows:]

PREPARED STATEMENT OF MR. OEHLER

THE CHEMICAL AND BIOLOGICAL WEAPONS THREAT

Overview

The proliferation of Weapons of Mass Destruction (WMD)—a term that includes chemical weapons and biological weapons, among others—is a global problem that cuts across geographic, political, and technological lines. Proliferation of these weapons is being undertaken by some of the largest and smallest, richest and poorest countries, led by some of the most reactionary and unstable regimes. Currently, some 20 countries—nearly half of them in the Middle East and South Asia—already have or may be developing these weapons. Many proliferators are convinced that they need to develop WMD and associated delivery systems to protect their national security. (See Annexes A and B for descriptions of chemical and biological agents.)

Many of the technologies associated with WMD programs, especially chemical and biological technologies, have legitimate civilian or military applications unrelated to WMD. Trade in those technologies cannot be banned. This paradox enables proliferating nations to acquire technologies and materials to develop chemical and biological weapons. For example, chemicals used to make nerve agents are also used to make plastics and to process foodstuffs. A modern pharmaceutical industry could produce biological warfare agents as easily as vaccines and antibiotics.

As dual-use technology and expertise continue to spread internationally, the prospects for chemical and biological terrorism increase. The relative ease of production increases our concern that the use of both chemical and biological weapons is attractive to terrorists. Moreover, the proliferation of WMD to more and more nations has increased the possibility that one or more of these states may choose to provide such weapons to terrorists.

At least as worrisome is the likelihood that terrorist groups or cults may have the technical sophistication to acquire or develop chemical and biological weapons. The incidents staged earlier this year by the Japanese cult Aum Shinnkyo demonstrate that the use of WMD is no longer restricted to the battlefield. Japanese authorities have determined that the Aum was working on developing the chemical nerve agents sarin and VX. The Aum was able to legitimately obtain all of the components that it needed to build its massive chemical and biological infrastructures. However, terrorist gr6ups and violent sub-national groups need not acquire the massive infrastructure that the Aum had assembled. Only small quantities of precursors, available on the open market, are needed to manufacture deadly chemical or biological weapons for terrorist acts. Extremist groups worldwide are increasingly learning how to manufacture chemical and biological agents, and the potential for additional chemical and biological attacks by such groups continues to grow.

Iraq: A Country Study

This country study examines the magnitude of Iraq's chemical and biological warfare programs and underscores the complexity faced by international efforts to curb the spread of these weapons. Details about the breadth of Iraq's chemical and biological warfare programs are presented to demonstrate the broad range of weapons that a state sponsor of terrorism has available in its arsenal and could provide to terrorists if it so chooses.

The unprecedented inspections conducted in Iraq by the UN have revealed much about Iraqi WMD programs. In the wake of the recent defection of two high-level Iraqis, the Baghdad government turned over to the United Nations Special Commission (UNSCOM) and the International Atomic Energy Agency (IAEA) a large cache of WMD—related documents and have revealed even more information in extensive discussions with both UN organizations. The sudden revelation of new information underscores the longstanding judgment that the Iraqis have made efforts to deceive UNSCOM and the IAEA. Such behavior resulted in UNSCOM Chairman Ekeus's delivery of a strongly worded report to the UN Security Council several weeks ago that was critical of Iraq's progress in fulfilling its obligations under the UN Resolutions imposed following the Gulf War. Iraq's latest revelations include:

Iraq's Chemical Warfare Program. The recent revelations demonstrate the ability of countries to hide these capabilities in the face of intrusive international inspection regimes.

- The Iraqi program to develop the nerve agent VX actually began as early as May 1985 and continued until December 1990 without interruption; Iraq claimed previously that its program spanned only the period April 1987 to September 1988.
- Iraq admitted producing 65 tons of chlorine, intended for the production of VX, and had more than 200 tons each of the precursor chemicals phosphorous

pentasulfide and diisopropylamine. Together, these three precursors would have been sufficient to produce almost 500 tons of VX.

- Iraq developed a true binary sarin-filled artillery shell, 122-mm rockets, and aerial bombs in quantities beyond prototype level.
- An Al Husayn missile with a chemical warhead was flight-tested in April 1990.
- Iraq received significant assistance from outside suppliers.

Iraq's Biological Warfare Program. The Iraqi Government adopted a policy to acquire biological weapons in 1974. Research and development began in 1975, but went into hiatus in 1978. In 1985, Iraq restarted biological weapons research and development. Initial work focused on literature studies, until bacterial strains were received from overseas in April 1986.

(The following information is based on oral declarations made since mid-August. Assurances as to the validity or comprehensiveness of the information cannot be given until the formal declaration is received.)

- A total of 6,000 liters of concentrated botulinum toxin and 8,425 liters of anthrax were produced at Al Hakam during 1990. An additional 5,400 liters of concentrated botulinum toxin were produced at the Daura Foot and Mouth Disease Institute during the period November 1990 to January 15, 1991; 400 liters of concentrated botulinum toxin was produced at Taji; and 150 liters of concentrated anthrax were produced at Salman Pak.
- Production of clostridium perfringens (a biological agent that causes gas gangrene) began in August 1990. A total of 340 liters of concentrated agent was produced.
- Static field trials of anthrax simulant and botulinum toxin were conducted using aerial bombs as early as March 1988. Effects were observed on test animals. Additional weaponization tests took place in November 1989, with 122-mm rockets. Live firings of 122-mm rockets filled with agents were conducted in May 1990.
- Large-scale weaponization of BW agents began in December 1990. Iraq filled more than 150 bombs and 50 warheads with agent. All these weapons were dispersed to forward storage locations.
- Iraq worked to adapt a modified aircraft drop tank for biological agent spray operations beginning in December 1990. The tank could be attached either to a piloted fighter or to a remotely piloted aircraft that would be guided to the target by another, piloted aircraft. The tank was designed to spray up to 2,000 liters of anthrax on a target. Iraq claims the test was a failure, but three additional drop tanks were modified and stored, ready for use.

THE GROWING TERRORIST THREAT

The Aum Shinrikyo attacks in June 1994, in Matsumoto, Japan, which killed seven and injured 500, and on the subway in Tokyo in March, which killed 12 and injured 5,500, were the first instances of large-scale terrorist use of chemical agents, but a variety of incidents and reports over the last two years indicate a growing terrorist interest in these weapons. These incidents include, but are not limited to:

- Tajik opposition members lacing champagne with cyanide at a New Year's celebration in January 1995, killing six Russian soldiers and the wife of another, and sickening other revelers.
- Press reports of the PKK (Kurdistan Workers' Party, a guerrilla group that opposes the Turkish Government) in southeast Turkey poisoning Turkish water supplies with cyanide.

Such examples reflect an increased interest in and a capability to produce chemical and biological agents. Open source literature—including access to the Internet—provides instructions on how to make some chemical agents.

Terrorist interest in chemical and biological weapons is not surprising, given the relative ease with which some of these weapons can be produced in simple laboratories, the large number of casualties they can cause, and the residual disruption of infrastructure. Although popular fiction and national attention have focused on terrorist use of nuclear weapons, chemical and biological weapons are more likely choices for such groups.

- In contrast to the fabrication of nuclear weapons, the production of biological weapons requires only a small quantity of equipment.
- Even very small amounts of biological and chemical weapons can cause massive casualties. The fact that only 12 Japanese died in the Tokyo subway attack de-emphasizes the significance of the 5,500 people who required treat-

ment in hospital emergency rooms. Such a massive influx of injured—many critically—has the potential to overwhelm emergency medical facilities, even in a large metropolitan area.

- Terrorist use of these weapons also makes them "weapons of mass disruption" because of the necessity to decontaminate affected areas before the public will be able to begin feeling safe.

The Aum Shinrikyo

The forthcoming trial of Aum leader Shoko Asahara has resulted in a number of revelations about the cult's activities. Press reports allege that:

- Asahara ordered the capability to produce sarin beginning in 1993; a large—agent production complex was not operational until March 1994.
- Some evidence suggests that the group may have tested sarin on sheep in Australia. Press reports claim that examination of some 30 sheep carcasses at an abandoned Aum site in Australia revealed the presence of sarin and other organophosphorous pesticides.
- Aum planned to produce enough agent to annihilate a large Japanese city by spraying it from a helicopter. Aum possessed a Russian helicopter and two drone airplanes that, with modifications, could have been capable of delivering chemical and biological weapons. A high-ranking Aum member reportedly obtained a helicopter pilot's license in the U.S. Press reports also allege that Aum was considering chemical attacks using remote-controlled aircraft.
- After the breakup of the Soviet Union, Aum expanded its activities in Russia, claiming some 30,000 followers there in addition to the 10,000 in Japan.
- Aum's Russian element broadcast religious radio programs into Japan from the Russian Far East.
- Video news footage indicates that a Russian-made GSP-11 toxic gas detector was found at the Aum compound in Japan. Designed to be used on the battlefield, the Russian detector can also be used in a nerve agent production/handling facility.
- Asahara intended the simultaneous chemical strike on 10 locations in the Tokyo subway to be a massive mystery attack that would divert attention from the cult.

Although the Aum Shinrikyo case demonstrates that terrorists can produce CW, they also may be able to directly acquire these weapons via other means:

- theft of agents from research labs;
- acquisition of commercially available poisons;
- theft of chemical munitions held by the military;
- black market activity;
- receipt of ready-made chemical weapons from a state sponsor.

EFFORTS TO CONTROL CHEMICAL AND BIOLOGICAL WEAPONS PROLIFERATION

U.S. Policy Initiatives

Stopping the proliferation of weapons of mass destruction has been a prominent goal of U.S. national security and foreign policy planning for several decades. Since the 1960s, when the U.S. sponsored the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), this country has recognized that proliferation is a global problem and that combating it requires high levels of international cooperation. The United States has, at times, exerted unilateral influence, successfully in several cases, to discourage proliferation, but remains committed to supporting multilateral efforts to stem proliferation.

The U.S. and other countries seeking ways to address proliferation of WMD have focused efforts on four aspects of the problem:

- Preventing states from acquiring WMD through the use of obstacles, such as export controls, sanctions against suppliers, or, in extreme cases, military action; and by fostering improvements in the international security environment directed toward reducing the perceived needs for such weapons through implementation of arms control arrangements, such as the NPT, the Chemical Weapons Convention (CWC), and the Biological Weapons Convention (BWC).
- Capping or rolling back existing programs by creating disincentives to deter states from developing such weapons or persuading them to reverse course by imposing sanctions, severing of travel and communications links, diplomatic isolation, implementing and strengthening credible verification regimes to international controls, and even military action under the provisions of Chap-

ter VII of the United Nations charter; or with incentives, such as offering benefits to states that agree to forgo efforts to acquire WMD—financial or technical assistance or exemptions from some export controls.

- Fostering deterrence of the use of WMD through regional or global arms control arrangements such as political accommodations, economic measures, military confidence-building measures, and arms controls that reduce the security threats used to justify the acquisition of WMD.
- Adapting military forces and emergency assets to respond to threats, ensuring U.S. forces' ability to operate against proliferated weapons.

International Measures

Chemical and biological weapons treaties are one element in the strategy to eliminate such weapons. The 1925 Geneva Protocol prohibits the use of chemical and biological weapons, but places no restriction on their production or possession. The CWC, opened for signature in 1993 and subsequently signed by 159 countries, bans the use, development, storage, or transfer of chemical warfare agents and their associated technology. The CWC will enter into force 180 days after the 65th country deposits its instruments of ratification. (To date, 40 countries have ratified the CWC.) In addition, the Convention requires States Parties to enact national legislation to control and monitor the export of some dual-use chemicals. The CWC will make it both more difficult and more costly for CW proliferators and terrorists to carry out their activities.

The BWC, ratified by 137 countries, prohibits the development, production, stockpiling, or transfer of biological agents and weapons and mandated the destruction of all existing stocks. At a BWC Special Conference, held in Geneva in September 1994, the U.S. promoted the development of a legally binding instrument that increased transparency of activities and facilities that could have biological weapons applications in order to help deter violations of, and enhance compliance with, the BWC.

The Australia Group (AG) was formed in 1984 as a result of the use of chemical weapons in the Iran-Iraq war. It is an informal forum of states whose goal is to discourage and impede proliferation by harmonizing national export controls on CW precursor chemicals and manufacturing equipment, sharing information on target countries, and seeking other ways to curb the use of chemical weapons. It has since been expanded to include biological weapons.

However, we believe that, despite international prohibitions, many countries with offensive chemical and biological weapons programs probably will press ahead with those efforts over the next ten years. Several countries of proliferation concern—including Libya, Syria, and Iraq—have so far refused to sign the CWC, and some chemical weapons-capable countries, such as Iran, have signed the CWC but show no signs of ending their programs.

Existing nonproliferation regimes and embargoes on chemical and biological weapons-relevant material and equipment have impeded but not stopped proliferation of those weapons. However, with the eventual ratification of the CWC and the implementation of a mandatory BWC compliance regime, new modalities will be emplaced that may increase the transparency of some biological and chemical weapons-related activities. By continuing to focus on export controls, the AG also will remain a viable force in curtailing the spread of chemical and biological weapons.

Iran's chemical weapons buildup, for example, runs contrary to the image it is trying to present in the disarmament arena. Even after signing the CWC in January 1993, Tehran continues to upgrade and expand its chemical weapons production infrastructure and chemical munitions arsenal. Iran is spending large sums of money on long-term capital improvements to its chemical weapons program as part of this expansion, which tells us that Tehran fully intends to maintain a chemical weapons capability well into the foreseeable future. As further evidence of Iran's intentions, Tehran is continuing its drive—begun during the Iran-Iraq war—to acquire increasingly toxic nerve agents and soon should have a production capability for these agents. It also is developing a production capability for precursor chemicals it needs to support chemical agent production, and within several years may become virtually independent of imported raw materials.

A further example of Tehran's deceptive disarmament initiatives is the drive it is leading among lesser developed countries to link ratification of the CWC with elimination of AG export controls. AG controls are complicating Iran's chemical weapons program expansion. If Iran were to succeed in eliminating these tougher controls, it would be able to acquire much more easily the precursor chemicals, production equipment, and technology it needs for its chemical weapons program.

Intelligence Community Support

In support of U.S. policy and international regimes, the U.S. Intelligence Community, together with other government entities, is waging an aggressive campaign to curb the spread of WMD. These efforts encompass:

- developing new technologies to detect chemical and biological weapons.
- developing a list of collection indicators to alert collectors and analysts prior to use of chemical and biological weapons.
- working more closely with other governments and with U.S. law enforcement for early detection of WMD programs.

Outlook

Curbing the spread of weapons of mass destruction among Third World countries and their acquisition by terrorist groups will require the continuation of an aggressive and cooperative international effort. Successful measures toward this end include educating the public, policymakers, and other government entities about the complex issue of proliferation and making available a mix of resources to address this troublesome problem.

ANNEX A

CHEMICAL AGENTS

Chemical warfare[1] agents are among the easiest WMD to produce. The toxicity of chemical agents falls generally between that of the more deadly biological agents and that of conventional weapons. The earliest chemical agents, first used in World War I, were far less sophisticated and far less lethal than those developed in subsequent decades. Proliferating nations have tended to first produce blister agents and, as their technologies advance, to develop the more lethal nerve agents.

Types of CW Agents

Choking agents are the oldest CW agents. This class includes chlorine and phosgene, first used in World War I. These agents have a corrosive effect on the respiratory system that causes the lungs to fill with water and choke the victim. These agents are delivered as heavy gases that remain near ground level and tend to fill depressions. They dissipate rapidly in a breeze and are among the least effective traditional CW agents.

Blood agents are absorbed into the body primarily by breathing; they prevent the normal utilization of oxygen by the cells and cause rapid damage to body tissues. This class includes cyanide and cyanogen chloride. They are highly volatile and in a gaseous state dissipate rapidly in air. These agents are most effective when delivered in a surprise attack.

Blister agents are used to cause medical casualties; they affect the eyes and lungs and blister the skin. Such agents are simple to produce, and include sulfur mustard, nitrogen mustard, and lewisite. Sulfur mustard is considered by some as the ideal CW agent. It presents both a respiratory and a percutaneous (skin) hazard, forcing personnel to wear masks and protective clothing. It is persistent and presents a long-term hazard, forcing decontamination of the battlefield.

G-series nerve agents, developed in the 1930s, cause paralysis of the respiratory musculature and subsequent death, in sufficient concentration. They include tabun, sarin, soman, and GF. These agents act rapidly and may be absorbed through the skin or the respiratory tract. Some agents, such as tabun and sarin, tend to be relatively nonpersistent, creating a short-term respiratory hazard on the battlefield.

V-series nerve agents, developed in the 1950s, are similar to, but more advanced than, G-series agents. This class includes VE, VG, VM, VS, and VX. These agents are more toxic and more persistent than the G-agents and present a greater skin hazard. They are used for long-term contamination of territory.

Production of CW Agents

Many CW agents, particularly choking, blood, and blister agents, are relatively easy to produce. Some of their technologies are more than 80 years old, making them accessible by virtually any Third World country and many terrorist groups. Newer agents, particularly nerve agents, are somewhat more difficult to produce. However, much of the technology to produce these agents is widely available in the public domain and, as demonstrated by the Aum Shinrikyo in Japan, these agents can be produced by a determined terrorist group.

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[1] Chemical warfare (CW) can be considered the military use of toxic substances such that the chemical effects of these substances on exposed personnel result in incapacitation or death. It is the impact of chemical effects instead of physical effects (such as blast and heat) that distinguishes chemical weapons from conventional weapons, even though both contain chemicals. In many cases in the Third World, there can be considerable confusion as to what is a chemical weapon and what is not. Some countries consider smoke, flame, incendiary, or riot control weapons to be chemical weapons and label them as such. In addition, conventional weapons can inflict casualties resembling those caused by chemical weapons.

Production of CW agents is similar to that of legitimate commercial compounds. Both involve use of standard chemical process equipment. Some of the more sophisticated equipment is distinctive enough to warrant special consideration, and some of this equipment is controlled by the Australia Group. In particular, equipment that is exceptionally resistant to corrosion has important applications for CW because of the highly corrosive compounds encountered in CW agent production.

Methods of Delivery

Development of a dispersal device is somewhat more technologically complex than the production of chemical agents. Many conventional munitions, such as bombs, artillery shells, grenades, and mines, can be modified to deliver chemical agents. A spray tank, commercially available for dissemination of agricultural chemicals from aircraft, can be used to disseminate chemical agents. Similarly, ground-based aerosol generators used to disseminate pesticides can be used for CW purposes.

ANNEX B

BIOLOGICAL AGENTS

Many developing countries see biological weapons—like chemical weapons—as having a twofold utility: as a "poor man's atomic bomb," intended to deter attacks from stronger, unconventionally armed neighbors; and as a relatively cheap force multiplier that can help compensate for shortcomings in conventional arsenals.

Because much of the same biotechnology equipment employed by modern pharmaceutical programs or laboratories associated with modern hospitals can be used to foster a biological weapons program, identification of an offensive biological warfare[2] program can be extremely difficult. Most equipment used in BW-related programs has legitimate applications, providing potential proliferators with the ability to conceal BW activity within legitimate research and development and industrial programs. The manufacture of vaccines for human or veterinary use can camouflage the production of large quantities of BW agents.

A number of experts speculate that terrorists might acquire biological agents more easily than chemical agents. And both BW and CW would be far easier to develop than nuclear weapons.

Types of BW Agents

BW agents differ widely in infectiousness, length of incubation period, and lethality.

- *Bacteria* are single-cell organisms that are the causative agents of anthrax, brucellosis, tularemia, plague, and numerous other diseases. They vary considerably in infectivity and lethality.
- *Rickettsiae* are microorganisms that resemble bacteria in form and structure but differ in that they are intracellular parasites that can reproduce inside animal cells. Examples of rickettsial diseases that might be used for BW include typhus, Rocky Mountain spotted fever, and Q fever.
- *Viruses* are intracellular parasites that are about 100 times smaller than bacteria. They can infect humans, crops, or domestic animals. An example of a virus that might be used for BW is Venezuelan Equine Encephalitis. VEE virus causes a highly infectious disease that incapacitates but rarely kills. A virus's strength can be altered to increase its efficiency. A particularly powerful strain of an endemic pathogen could simply be blamed on a chance natural mutation.
- *Fungi* do not generally cause disease in healthy humans. Fungal diseases are, however, devastating to plants and might be used to destroy staple crops and cause widespread hunger and economic hardship. Examples of plant fungal pathogens include rice blast, cereal rust, and potato blight.
- A *toxin* is a poisonous substance made by a living system, or a synthetic analogue of a naturally occurring poison. An enormous variety of toxins are man-

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[2] Biological warfare (BW) can be considered the military use of living organisms or associated materials that are intended to cause disability, disease, or death in humans, animals, or crops—for hostile purposes. Agents include pathogenic micro-organisms, toxins and bioactive substances, which may be weaponized, using both military and civilian-type delivery systems.

ufactured by bacteria, fungi, marine organisms, plants, insects, spiders, and animals.

Production of BW Agents

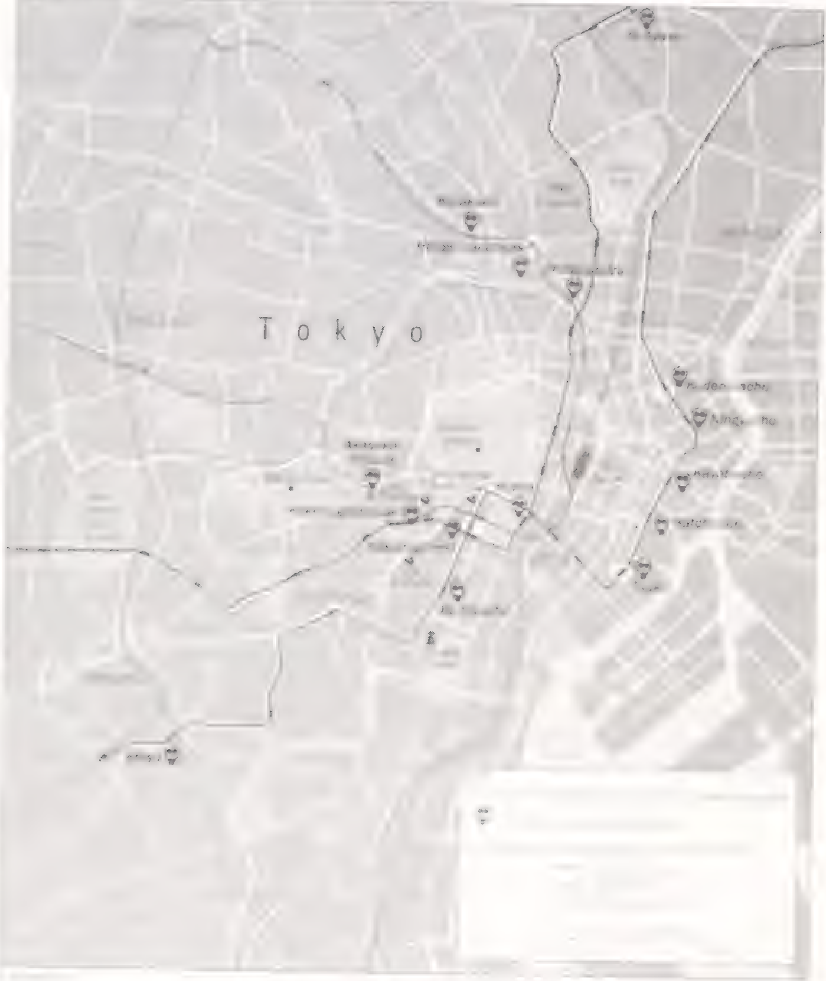
BW agents are relatively easy and inexpensive to produce for any nation that has a modestly sophisticated pharmaceutical or fermentation industry. Mass-production methods for growing cultures are widely used in the commercial production of yogurt, yeast, beer, antibiotics, and vaccines. Almost all equipment needed for the production of pathogens and toxins is dual-use and available on the international market, increasing the potential for concealing illicit activities under the cover of legitimate production.

Methods of Delivery

BW agents are nonvolatile solids that would be disseminated either as a liquid slurry or a dry powder of freeze-dried organisms or toxin. Possible delivery systems range in complexity and effectiveness from an agricultural sprayer mounted on a truck to a specialized cluster warhead carried on a ballistic missile. The key to producing large-scale respiratory infections is to generate an aerosol or stable cloud of suspended microscopic droplets, each containing from one to thousands of bacterial or virus particles. Fogs and smokes are examples of visible aerosols.

[illegible]

Contaminated Sites From the March 1995 Attack on the Tokyo Subway System



[illegible]

Senator NUNN. Thank you, Dr. Oehler. I appreciate your testimony.

Ms. Fenchel?

TESTIMONY OF CONNIE J. FENCHEL, DIRECTOR, STRATEGIC INVESTIGATIONS DIVISION, OFFICE OF OPERATIONS, OFFICE OF INVESTIGATIONS, U.S. CUSTOMS SERVICE

Ms. FENCHEL. Thank you, Senator and members of the Subcommittee.

I am Connie Fenchel, the Director of Strategic Investigations for the U.S. Customs Service. I have been a special agent for the Customs Service for the past 18 years. Senator, I, too, am over 35 years of age. [Laughter.]

I would like to summarize my remarks before the Subcommittee and request that my complete statement be submitted for the record.

Senator NUNN. Without objection, all of your statements will be part of the record.

Ms. FENCHEL. Thank you. Senator, I come here today to describe the efforts of the U.S. Customs Service to thwart the proliferation of weapons of mass destruction by countries, organizations, and groups who threaten our global security. As you are well aware, the Customs Service is the first line of defense against the proliferation of these weapons.

In our role as guardians of our borders, the Customs Service protects our Nation from the illegal importation of goods that are harmful to our security and economy. We are at the front lines in the war against international and domestic terrorism, enforcing nine different laws in this arena.

We are tasked with the mission of stopping terrorist tools from entering this country before they can harm our Nation's people. In our over 200-year history, the Customs Service has been the guardians of our Nation's borders from illegal imports. Over the past 15 years, our authorities have been expanded to include the protection of our country from illegal exports, as well.

In a few minutes, I will provide you with some tangible examples of how Customs investigates subjects whose goal is to supply terrorist countries and organizations. But first, I would like to convey some important information about how our export control program works. This information will illustrate to you how complex this effort is.

Our export control program is the mechanism through which the Customs Service protects the global community from the proliferation of weapons of mass destruction, including nuclear, chemical, and biological weapons. As the Subcommittee is aware, no U.S. company still manufactures chemical weapons, but the precursors and components used to manufacture these agents are still available in the United States because many of these components have a legitimate and necessary purpose.

Customs is charged with ensuring that the legitimate export of these chemicals and equipment is conducted without harm to our industries while ensuring that these same materials do not fall into the hands of our adversaries. This daunting task is essential to the role of the Customs export control program.

The Customs Service conducts its export control program through a four-pronged approach. This approach is known as the four "I"s and it is divided into interdiction, investigations, intelligence coordination, and international cooperation and training.

Customs interdiction efforts are conducted at the more than 300 ports of entry and exit, including international airports, land borders, and sea ports. Customs has 6,000 inspectors assigned to inspect people and cargo upon entry into the United States. Authority is derived from the export control statutes, as well as other laws and regulations that permit the warrantless search of persons, vessels, vehicles, other conveyances, and cargo for detecting illegal exports.

The investigations prong of the Customs Service export effort is the responsibility of the Customs Office of Investigations. We have 4,400 employees. It is composed of over 2,400 special agents, marine enforcement officers, and air interdiction officers, along with 323 pilots and 300 Customs intelligence analysts. This workforce is charged with the investigation of smuggling both inbound and outbound, money laundering, narcotics trafficking, and the fraudulent importation of goods.

Customs has 20 domestic special agents in charge and 21 Customs attache offices overseas. These offices are composed of a cadre of investigators that possess highly-developed expertise in enforcing Customs laws and regulations.

In the export investigations field, special agents are trained in the detection and investigation of illegal technology and arms exports. Export control investigations last year resulted in the arrest of 242 people and the seizure of 809 illegal shipments of goods.

One of the most important elements of export enforcement strategy is our industry outreach program called Operation Gemini. Operation Gemini is a program where Customs agents solicit the cooperation of exporters, manufacturers, and freight forwarders throughout the United States to act as the eyes and ears of the Office of Investigations.

The Gemini program has a two-fold purpose. The first purpose is to provide exporters and freight forwarders with the information to ensure that their exports comply with the appropriate export regulations. Aside from ensuring compliance, the Gemini contacts also afford Customs with the ability to gain the lawful cooperation of exporters and to sensitize them to the possibility that some of the commodities they export could be sought by individuals who seek to divert technology into weapons programs or seek to obtain a commodity or munition for an end user that would not be licensed.

Information is provided to exporters during Gemini contacts to ensure compliance with all the applicable export regulations. Gaining the cooperation of the exporting community may be the single most important factor in detecting subjects who pose a threat to our national security by dealing in weapons of mass destruction.

The third prong in our export control strategy is intelligence coordination. The Customs Service works in close cooperation with the intelligence community to glean valid intelligence data to assist Customs export investigations. The intelligence community has a vast apparatus for the collection and dissemination of intelligence data regarding potential persons and entities involved in weapons proliferation.

I would like to provide the Subcommittee with more details of how we have fostered better cooperation and coordination with the intelligence community, but I would prefer to discuss these matters in a closed session as they are sensitive.

The fourth prong of our enforcement strategy is international cooperation and training. The U.S. Customs Service possesses a wealth of talent and information in the export enforcement field. Many countries have little to no export control laws or regulations. Although many of these countries have been willing to assist in U.S. export investigations and have cooperated with our attaches overseas, they have not had the ability to investigate export violations.

Customs lends its expertise through hands-on training, lectures, seminars, and other training schools to countries around the world. The newly-independent states of the former Soviet Union have been particularly receptive to U.S. efforts to develop export controls and enforcement programs. Customs officers have participated in training programs for 30 countries in the past 2 years. The international cooperation of customs services and police agencies to thwart weapons proliferation is the cornerstone of these training programs.

As recently as September of this year, the U.S. Customs Service co-hosted, along with the German Customs Service, a seminar on nuclear smuggling in Garmisch, Germany. The seminar was attended by over 100 participants representing 32 countries, all exchanging information on methodologies for detecting the smuggling of radioactive materials.

In 1995 alone, Customs provided export control and enforcement training assistance to Khazakstan, Russia, Latvia, Lithuania, Estonia, Belarus, Poland, Krygstan, Romania, Ukraine, Bulgaria, Macedonia, Slovakia, and the Czech Republic. In addition, Customs maintains numerous mutual assistance agreements and customs-to-customs cooperation agreements with many countries.

It is important to understand that the nuclear-biological-chemical threat is a global one. As you can see from the two world and regional maps illustrating countries of chemical-biological warfare concerns, the issue of CBW proliferation is not localized. The countries colored in red are CBW countries of concern. The countries colored in green are countries of diversion concern.

Now I would like to speak specifically of some of the investigations the Customs Office of Investigations has conducted recently that illustrate our efforts in controlling CBW agents, pathogens, and equipment.

I know the Subcommittee is particularly interested in the Aum Shinrikyo cult. The Customs Service has three investigations that involve this cult, two in San Jose, California, and one in New Haven, Connecticut. One of the San Jose cases resulted in the seizure of 400 gas masks which were purchased by the Aum cult and destined for Japan. This shipment was scheduled to be exported on March 22, 1995. However, the shipment was recalled from the freight forwarder on March 20, 1995, when the broker heard of the sarin gas attack.

I have with me today one of the gas masks that was subsequently surrendered to the Customs Service by the broker. As you can see, these masks are Israeli military surplus. You can see the Israeli markings on the box, the Hebrew markings on the box. We have 399 other ones of these in seizure right now. Our investigation is continuing in New York, where the gas masks were originally purchased by a member of the Aum cult.

The San Jose Customs office also conducted an investigation into the Aum's attempt to acquire a sophisticated laser from a Northern California manufacturer. On March 3, 1995, an Aum sect member attempted to purchase a custom welding and cutting laser from this company. The value of the laser was estimated at $400,000.

The sect member who was negotiating for the laser with the California company did not possess the technical expertise to answer specific information from the laser company. The Aum member initiated a telephone conference between the California company and an individual identified as Mr. Murai, who was supposedly the Aum sect's lead engineer. Our investigation has learned that Mr. Murai has been identified as Hidel Murai, the Aum cult's minister of science and technology.

Despite additional information received from Murai, the company was unable to identify the exact application for which the laser was needed by the Aum cult. The sect members never contacted the California company again about the laser.

On April 23, 1995, Murai was murdered outside the Aum headquarters in Tokyo. Murai's assailant was identified as an individual associated with Japanese organized crime. The exact motive for Murai's assassination has not been established.

In 1993, Aum representatives approached a Middlefield, Connecticut, company for the purpose of purchasing an interferometer. The company manufacturers interferometers, which are sophisticated devices used to make critical measurements of polished surfaces by means of a laser. This technology has nuclear applications.

The international sales administrator for the company advised the U.S. Customs Service through the Operation Gemini program that the company planned to demonstrate the system to the Aum representatives, but the Aum representatives failed to bring the material they wanted measured by the interferometer. There were no sales and no exports by the company to the Aum cult.

I would like to give an example of one other case that Customs conducted involving sarin gas. In 1988, Juwhan Yun, a naturalized U.S. citizen, formerly Korean, was doing business as president of Komex International in Newark, New Jersey. Komex was an exporting company involved in weapons shipments and did most of its business with South Korea. Yun made inquiries of a New York company about purchasing ammunition for South Korea. However, the company believed that the end user was other than the Republic of South Korea and contacted the U.S. Customs Service.

A Customs undercover special agent contacted Yun under the guise of an arms broker. From June 1988 until Yun's arrest in January 1989, the Customs agent, posing as an arms dealer, negotiated with Yun for purchase of TWO missiles, stinger missiles, classified U.S. missile technology, radar systems, and other defense articles and munitions. In all of the dealings with Yun, he failed to obtain a valid export license issued by the United States Department of State and thereby violated the Arms Export Control Act.

A court-ordered wiretap of Yun's phone and fax machine conducted in 1988—in November 1988, a fax from a co-conspirator in London named Charles Caplan was received which requested Yun to procure from his American supplier, which was the Customs undercover front company, a large quantity of sarin nerve gas.

In an overt act to further the conspiracy, Yun traveled to London to meet Caplan and his associates and opened a bank account at the Korea First Bank under a fictitious name. Yun eventually wire transferred funds to the undercover front company and returned to the U.S. with specific instructions for procuring the CW agent. Yun asked the undercover agent for 500 MK94 gas bombs and 500 MK116 "weteye" bombs filled with liquid sarin. This was over 250 tons of sarin. This amount would contain over 1.25 billion lethal doses of the nerve gas. Both of these bombs were designed to be dropped from an aircraft.

Yun suggested to the Customs undercover agent that he mislabel the sarin bombs as crankshafts on the export documents and to procure a false export license. Yun agreed to pay $100,000 to the undercover agent to obtain the falsely-documented license. Yun explained to the undercover agent that he should provide a false end user for the crankshafts and stated they were destined for Mozambique or Pakistan, rather than the intended destination of Iran.

On January 12, 1989, Yun was arrested in Newark. Yun was tried in the District of New Jersey and convicted of conspiring to export nerve gas, but acquitted of attempting to export bombs. No bombs ever left the United States. Yun was sentenced in September 1989 to 30 months in prison. Charles Caplan was indicted by a Federal grand jury and Caplan is currently an outstanding fugitive. We have with us a wanted poster for Charles Caplan.

The description of these cases are brief. They do not reflect the months upon months of investigative activity that is required to bring an export case to a successful conclusion. These cases are staffing-intensive. Monitoring of electronic surveillance takes hundreds of staff hours. Development of undercover operations and covert identities requires extensive development to ensure the true nature of our operations are not apparent.

The cost of these operations is also extremely high. Many times, these cases are so costly and so staffing-intensive they cannot be conducted. This is not to say that we permit violators or violations to go unchecked, but the success of undercover operations has always been the fact that they detect violations that could not have been detected under normal scrutiny.

I hope this information demonstrates to the Subcommittee the important role that Customs plays in thwarting the proliferation of chemical and biological warfare agents and terrorist organizations. Thank you.

[The prepared statement of Ms. Fenchel follows:]

PREPARED STATEMENT OF CONNIE J. FENCHEL

Good morning/afternoon, Mr. Chairman and Members of the Subcommittee. Thank you for this opportunity to discuss the role of The U.S. Customs Service in the interdiction of components for developing chemical and biological warfare agents. I am the Assistant Director for Operations of the Office of Investigations of the Customs Service. I direct the activities of the Strategic Investigations Division which is responsible for the Customs Service's export control and enforcement activities.

To understand the Customs Service's role in controlling the export of commodities and equipment used in the development of nuclear, biological or chemical warfare (NBC) agents or weapons, as well as our efforts to thwart the acquisition of such agents by terrorist organizations, it is important to understand the Customs Service's role in export control and enforcement. We are at the front lines in the war against international and domestic terrorism, enforcing nine different laws in this arena. We are tasked with the mission of stopping terrorist's tools from entering this country and before they can harm our nation's people.

Customs Role in Export Control

As you are aware, the Customs Service is the first line of defense in ensuring the safety of our nations's borders. As such, Customs is responsible for ensuring that all goods and persons entering or exiting the United States do so in accordance and adherence with all the United States laws and regulations. With this mandate, Customs derives its responsibilities for export control. Export control and enforcement can be divided into three (3) principle areas:

- Commodities Export Control
- Arms and Munitions Export Control
- Foreign Policy Sanctions and Embargoes

These three areas encompass the foundation of Customs export control efforts.

Commodities Export Control

The control of commodities is described as the licensing of exports of dual-use commodities which can be used in the development of weapons of mass destruction including nuclear weapons, chemical and biological agents and missile systems. This dual use technology is licensed under the authorities of the Export Administration Act (EAA) by the U.S. Department of Commerce's Bureau of Export Administration. The EAA describes the requirements for exporting commodities from the United States to countries throughout the world, both friend and foe. The EAA provides the Customs Service with a broad range of authorities to search persons, cargo and conveyances to ensure that exports of such commodities are appropriately licensed and that the end-use of such commodities is not for use in the development of weaponry. Under the EAA, the precursor chemicals and biological pathogens which can be used in the manufacture of warfare agents, are controlled. It is important to understand that the same precursor chemicals and biological pathogens used in the development of warfare agents also have a lawful and practical application. For instance, a precursor used in the development of a chemical warfare agent is also used in the manufacture of fluoride toothpaste. A biological pathogen used in the development of a vaccine can also be used to manufacture a deadly antipersonnel agent. In addition to controlling these chemicals and biologicals, the EAA also controls much of the equipment and materials that is used in the development of nuclear weapons and the manufacture of chemical and biological warfare agents. Again, this equipment also has a legitimate dual-use.

Arms and Munitions Controls

The second area of export control is the control of munitions, arms and weaponry. The export licensing authority for munitions is the U.S. Department of State. The Arms Export Control Act (AECA) is the law which controls the sale and export of munitions, weapons systems, and other military equipment such as CBW protective clothing and equipment. The AECA and its applicable regulations contained in the International Trafficking in Arms (ITAR) regulations control items that are inherently military in character, including:

- chemical agents with military application;
- equipment for the dissemination, detection and identification of and defense against NBC warfare agents and weapons;
- the technical data used in or related to NBC production; and
- any defense services including training to foreign persons in the design, development, production, or use of any defense article including NBC agents and weapons.

The AECA and ITAR provide the Customs Service with the exclusive authority for enforcing munitions export control. The Customs Service for the past 14 years, has acted as the law enforcement arm of the State Department for controlling military exports from the United States.

Foreign Policy Sanctions and Embargoes

The third area is foreign policy export controls such as embargoes (partial or full) and economic sanctions and restrictions. These export controls are an integral part of the President's foreign policy mission. Sanctions, embargoes and restrictions against countries that violate international law or are involved in human rights violations are sanctioned under several laws including the Trading with the Enemy Act and the International Emergency Economic Powers Act. These statutes, among other things, permit the Administration to prevent exports of a given commodity or all exports as a whole to a given country. These export controls are also enforced by the Customs Service.

These three areas form the foundation through which Customs controls the exports of dual use technology, munitions as well as enforcing the foreign policy of the President including the export of materials used in the development and dissemination of weapons of mass destruction.

Export Control Approaches for Enforcement: The Four I'S

The Customs Service utilizes a four-pronged approach to attacking the broad process of export controls and enforcement. This approach is known as the Four I's and is divided into Interdiction, Investigation, Intelligence Coordination and International Cooperation and Training.

Interdiction

Customs Interdiction efforts are conducted at the more than 300 ports of entry and exit including international airports, land borders and seaports. Customs has approximately 6,000 inspectors assigned to inspect people and cargo upon entry into the United States. A core of those inspectors are dedicated to export control. Authorities derived from the previous mentioned statutes as well as other laws and regulations permit the warrantless search of persons, vessels, vehicles, other conveyances and cargo for detecting illegal exports. The special cadre of inspectors that conduct export inspections are trained in the sophisticated methods of detecting illegally exported goods.

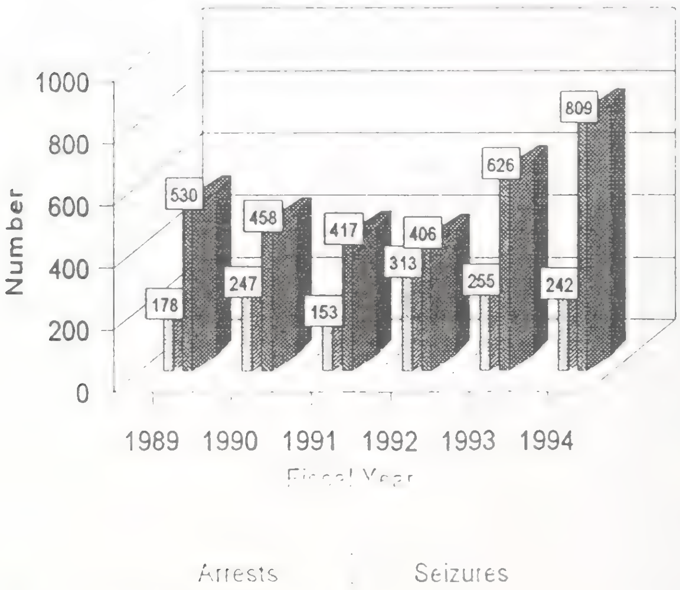
Inspectors are also aided by a wide array of computerized systems which help narrow the volume of potential targets of opportunity and verify legitimate exports. Customs now has a computer interface with the four export licensing agencies of the Federal Government. Customs interfaces with the export licensing and enforcement systems of these agencies via the Treasury Enforcement Communications System (TECS). This system interfaces on a real-time basis with:

- The Department of Commerce's Bureau of Export Administration ECASS System which contains data on the export licenses of dual-use commodities;
- The Department of State's Office of Defense Trade Controls System on munitions and defense articles licensed for export;
- The Treasury Department's Office of Foreign Assets Control which provides suspect information on sanction and embargo violations directly into TECS; and
- The Drug Enforcement Administration's online system of licensing the exports of narcotics precursor chemicals and materials.

This multi-agency system is currently used in a cumbersome manner, requiring the user to query each sub-system separately. But the Customs Service is in the process of developing a new, cohesive system which combines these assets into a one-stop query for all export licensing. The creation of the Automated Export System will enable Customs inspectors to review the exportation paperwork more quickly and target those shipments which may be suspected of containing illegal exports, unlicensed goods, misdescribed commodities or other means to thwart our U.S. export controls. In these days of a right-sized workforce, Customs must work smarter to ensure compliance with export laws without impeding legitimate exports. This automated system is one effort to work smarter through better use of technology. In addition, Customs continues to develop inspectional aids on the cutting edge of technology to ensure rapid inspections of cargo and persons with as little intrusion as possible.

Investigations

The Investigations prong of the Customs Service's export effort is the responsibility of the Office of Investigations and its 4400 employees. The Office of Investigations is composed of 2480 special agents, marine enforcement officers and air interdiction officers along with 323 Customs pilots and 300 Customs intelligence analysts. This workforce is charged with the investigation of smuggling (both inbound and outbound), money laundering, narcotics trafficking, and the fraudulent importation of goods. Customs has 20 domestic Special Agents in Charge and 21 Customs Attaches offices overseas. These offices are composed of a cadre of investigators that possess highly-developed expertise in enforcing Customs laws and regulations. In the export investigations field, special agents are trained in the detection and investigation of illegal technology and arms exports, sanction and embargo violations as well as the prevention of the proliferation of weapons of mass destruction. Export control investigations last year resulted in the arrest of 242 people and the seizure of 809 illegal shipments of goods.



Export Control and Enforcement

Arrests and Seizures - FY 1989-1993

The Office of Investigations utilizes a myriad of techniques and methods in the conduct of its criminal investigations. These include a wide range of visual, electronic and physical surveillance, records reviews, mail covers, interviews and grand jury investigations. One of the most important elements of our export enforcement strategy is our industry outreach program called Operation Gemini. Operation Gemini is a program where Customs agents solicit the cooperation of exporters, manufacturers and freight forwarders throughout the United States to act as the eyes and ears of the Office of Investigations. The Gemini program has a twofold purpose. The first purpose is to provide exporters and freight forwarders with information to ensure that their exports comply with the appropriate export regulations.

Aside from ensuring compliance, the Gemini contacts also afford Customs with the ability to gain the lawful cooperation of exporters and to sensitize them to the possibility that some of the commodities they export could be sought by individuals who seek to divert technology into weapons programs or seek to obtain a commodity or munition for an end user that would not be licensed to receive such goods. Information is provided to exporters during Gemini contacts to ensure compliance with all the applicable export regulations along with increasing their awareness of the potential for illegal activities. Gaining the cooperation of the exporting community may be the single most important factor in detecting subjects who pose a threat to our national security by dealing in weapons of mass destruction. I will discuss some specific investigations which highlight our role in CBW non-proliferation further on it this statement.

Intelligence

The third prong in our Export Control Strategy is Intelligence Coordination. The Customs Service works in close cooperation with the Intelligence Community (IC) to glean intelligence data to assist Customs export investigations. The IC has a vast apparatus for the collection and dissemination of intelligence data regarding potential persons and entities involved in weapons proliferation overseas. In addition, they have information on commodities that are being sought by proliferators from sources here and abroad. Historically, intelligence information has provided us with areas to explore for criminal investigations. In addition, the data derived from the IC forms the basis of our NBC threat assessments.

International Cooperation

The fourth prong of our enforcement strategy is International Cooperation and Training. The U.S. Customs Service possesses a wealth of talent and information in the export enforcement field. Many-countries have little to no export controls, laws or regulations. Although many of these countries have been willing to assist in U.S. export investigations and have always cooperated. with our Customs Attaches, they have not had the ability to investigate export violations. Customs lends its expertise through hands-on training, lectures, seminars and other training schools to countries around the world. The newly independent states of the former Soviet Union have been particularly receptive to U.S. efforts to develop export controls and enforcement programs. Customs officers have participated in training programs for 30 countries in the past two years.

The international cooperation of customs services and police agencies to thwart weapons proliferation is the cornerstone of these training programs. As recently as September of this year, the Strategic Investigations Division co-hosted (along with the German Customs Service) a Seminar on Nuclear Smuggling in Garmisch, Germany. The seminar was attended by over 100 participants representing 32 countries, all exchanging information on methodologies for detecting the smuggling of radioactive materials. In 1995 alone, Customs provided export control and enforcement training assistance in Kazakstan, Russia, Latvia, Lithuania, Estonia, Belarus, Poland, Krygystan, Romania, Ukraine, Bulgaria, Macedonia, Slovakia and the Czech Republic.

This four pronged enforcement strategy enables Customs to detect export violations and pursue violators with vigor, throughout the globe. In addition, the Customs Service has over twenty five Customs Mutual Assistance Agreements (CMAA) with countries and other customs services which serve as a conduit for information exchange and investigative assistance.

Chemical and Biological Agent Controls

I would now like to address specifically how the Customs Service controls and enforces the restrictions on exports of chemical precursors and biological pathogens. I think it is important to note that the United States no longer manufactures chemical or biological warfare agents. Inasmuch as their manufacture is prohibited, export of actual agents is non-existent. However, the materials used to manufacture chemical and biological agents are readily available from United States manufacturers such as chemical makers and supply houses and biological collection and type culture companies. In addition, the equipment needed to manufacture chemical and biological warfare (CBW) agents is also available from U.S. companies. Let me reiterate that many of these components have legitimate uses. Without biological pathogens and cultures we could not manufacture vaccines or test antibiotics. Many of the chemicals used for CW irritants and agents have lawful uses like cosmetics and agricultural products.

There is an international control regime whose member countries carefully control CBW precursors and pathogens. The Australia Group (AG) was formed to provide a control regime for CBW. The AG currently has 29 member nations. The AG controls the exports of some 54 precursors which are used in warfare agent production. In the past two years, the AG has instituted controls on fermenting equipment and other apparatus which is used in CBW production. The Customs Service has played an active role in the enforcement working group of the Australia Group. We have lent our expertise to discussions on the enforcement of CBW controls. Much of the work of the AG has been incorporated into the language of the Chemical Weapons Convention and the Biological Weapons Convention which will come under review by the Senate, hopefully this year.

Case Histories

I would now like to discuss a couple of examples of the types of investigations the Customs Service conducts in the CBW arena. Many of these cases developed from various sources or impetus. would like to cite one or two cases whose origins where developed from a variety of sources. I know that the Subcommittee is particularly interested in the AUM Shinrikyo Cult. The Customs Service has three cases that involve the Aum Shinrikyo Cult of which the Subcommittee is well aware, two in San Jose and one case in New Haven, CT.

One of the San Jose cases resulted in the seizure of 400 gas masks which were purchased by the AUM cult and destined for Japan. This shipment was scheduled to be exported on March 22, 1995. However the shipment was recalled from the freight forwarder on March 20, 1995, when the broker heard of the Sarin gas attack on the Tokyo subway. I have with me today, one of the gas masks that were subsequently surrendered to the Customs Service by the broker. As you can see, these masks are Israeli military surplus and have Hebrew markings on the boxes. The Customs investigation into this shipment is continuing in New York where the gas masks were originally purchased by a member of the AUM cult.

The San Jose Customs office also conducted an investigation into the AUM cult's attempt to acquire a sophisticated laser from a Northern California manufacturer. On March 3, 1995, an AUM sect member attempted to purchase a custom welding and cutting laser from this company. The value of the laser was estimated at $400,4000. The sect member who was negotiating for the laser with the California company did not possess the technical expertise to answer specific inquiries from the laser company. The AUM member initiated a teleconference between the California company and an individual identified as Mr. Murai, who was supposedly the AUM sect's lead engineer. Our investigation has learned that Mr. Murai has been identified as Hideo Murai, the AUM Cult's Minister of Science and Technology. Despite additional information received from Murai, the company was unable to identify the exact application that the laser was needed for by the AUM sect. The sect members never contacted the California company again about the laser. On April 23, 1995, Murai was murdered outside the AUM headquarters in Tokyo. Murai's assailant was identified as an individual associated with Japanese organized crime. The exact motive for Murai's assassination has not been established.

In 1993, AUM representatives approached a Middlefield, Connecticut, company for the purpose of purchasing an interferometer. The Company manufactures interferometers, which are sophisticated devices used to make critical measurements of polished surfaces by means of a laser. This technology has nuclear applications. The International Sales Administrator for the company advised the U.S. Customs Service that the company planned to demonstrate the system to the AUM representatives, but the AUM representatives failed to bring the material they wanted measured by the interferometer. There were no sales by the company to the AUM cult.

As I discussed previously, another one of the techniques Customs agents utilize in thwarting the export of CBW precursors and components is the conduct of undercover investigations. Specially trained Customs agents acting in undercover capacities, pose as weapons dealers or exporters capable of circumventing export controls. This technique has been extremely successful in identifying suspects who are seeking CBW components and other munitions for exports to countries such as Iran and Iraq. With the appropriate business acumen, Customs undercover agents provide suspects with the opportunity to obtain CBW components, while the materials are safely under the control of the U.S. Government. In all instances when such a technique is used, Customs agents are extremely careful to provide the means or opportunity for obtaining the illegal material, however, they are always cautious that the suspect has the intent to acquire the goods prior to Customs providing the opportunity.

Manfred Felber Case

One such example of a successful undercover operation is the Manfred Felber case. In February 1994, the Customs Resident Agent in Charge in Portland, Oregon, initiated an investigation on Manfred Felber, an Austrian national who was suspected of procuring chemical warfare equipment on behalf of the Iranian Government. Felber had approached a confidential informant in Oregon, asking that the informant assist him in obtaining 90 chemical agent monitors (CAM). The informant, who was not knowledgeable of what the monitors were, asked his control agents to obtain information for what the CAMs were used.

Customs agents explained that chemical agent monitors were used as a safeguard in the manufacture of chemical warfare material. It was decided that Customs agents would pose as arms dealers capable of obtaining the CAMs. Felber was approached and explained to the undercover agents that he would need false end user certificates to conceal the true destination for the CAMs which was Iran. Felber also requested that the undercover agents assist him in obtaining other munitions destined for Iran.

During the undercover negotiations, which were recorded by the undercover agents, Felber provided valuable intelligence concerning his participation in the international trafficking of munitions and chemical weapons. Felber told the undercover agents that he would be able to provide partial payment for the munitions and CAMs in heroin. Felber claimed that he would have to return to Iran to arrange for the shipment of heroin. It is suspected that the heroin payment would have been arranged by officials of the Iranian Government. Fraudulent shipping papers were prepared and funds were transferred to a U.S. bank at Eugene, Oregon. Felber indicated that the funds were provided by the Government of Iran and that they had passed through banks in Germany, Austria, and Hong Kong.

Due to the significance of Felber as an international arms trafficker, it was decided not to permit Felber to depart the country and that payment would be in U.S. Currency. On March 15, 1994, Felber was arrested in Oregon, and charged with violating the Arms Export Control Act and the Money Laundering Control Act. At the time of his arrest, $305,000 was seized from Felber's bank account. On March 18, 1994, another $300,000 was seized from another bank account belonging to Felber. Felber subsequently pleaded guilty to the charges and was sentenced to four years imprisonment.

Yun/Caplan Case

I would like to discuss another investigation which utilized an undercover operation to detect CBW violations. In 1988, Juwhan Yun, a naturalized U.S. citizen (formerly Korean) was doing business as President of Komex international in Newark, New Jersey. Komex was an exporting company involved in the weapons shipments and did most of its business with South Korea. Yun made inquiries of a New York company about purchasing ammunition for South Korea. A former Customs Agent who worked at this company reported Yun to Customs investigators as there were suspicions that Yun was procuring weapons for an end-user other than the Republic of South Korea.

A Customs undercover Special Agent contacted Yun under the guise of an arms broker. From June 1988 until Yun's arrest in January 1989, the Customs agent posing as an arms dealer, negotiated with Yun for purchase of TOW missiles, Stinger missiles, classified U.S. missile technology, radar systems, and other defense articles and munitions. In all of the dealings with Yun, he failed to obtain a valid export license issued by the United States Department of State and thereby violated the Arms Export Control Act.

A court-ordered wiretap of Yun's phone and fax machine was conducted in 1988. In November 1988, a fax from a co-conspirator in London named Charles Caplan was received which requested Yun to procure from his American supplier (which was the Customs undercover front company), a large quantity of Sarin nerve gas. In an overt act to further the conspiracy, Yun traveled to London to meet Caplan and his associates, and opened a bank account at the Korea First Bank under a fictitious name. Yun eventually wire-transferred funds to the undercover front company, and returned to the U.S. with specific instructions for procuring the CW agent. Yun asked the undercover agent for 500 MK 94 Gas Bombs and 500 MK116 "Weteye" bombs, filled with liquid Sarin. Both of these bombs were designed to be dropped from an aircraft and are capable of disbursing a large volume of nerve gas over a large area.

Yun suggested to the Customs undercover agent that he mislabel the Sarin bombs as "crankshafts" on the export documents, and to procure a false export license. Yun agreed to pay $100,000 to the undercover agent to obtain the falsely documented license. Yun explained to the undercover agent that he should provide a false end user for the "crankshafts" and stated that they were destined for Mozambique or Pakistan rather than the intended destination of Iran.

On January 12, 1989, Yun was arrested in Newark. Yun was tried in the District of New Jersey and convicted of conspiring to export nerve gas but acquitted of attempting to export the bombs. (No bombs ever left the United States.) Yun was sentenced in September 1989 to 30 months in prison. Charles Caplan was indicted by a Federal Grand Jury and Caplan is currently an outstanding fugitive.

The descriptions of these cases are brief. They do not reflect the months upon months of investigative activity that is required to bring an export case to a successful conclusion. These cases are staffing intensive. Monitoring of electronic surveillance takes hundreds of staff hours. Development of undercover operations and covert identities requires extensive development to ensure that the true nature of the operations are not apparent. The cost of these operations is also extremely high. Many times these cases are so costly and so staffing intensive that they cannot be conducted. This is not to say that we permit violators or violations to go unchecked. But, the success of undercover operations has always been the fact that they detect violations that would not have been detected under normal scrutiny. These operations reveal intelligence about the underground operations that exist within the United States and abroad, that law enforcement could not normally penetrate.

I hope this information sufficiently illustrates the important role that Customs plays in thwarting the proliferation of nuclear materials and chemical and biological warfare agents and terrorist organizations. I would gladly welcome your questions at this time.

Senator NUNN. Thank you, Ms. Fenchel. We appreciate the important role that Customs plays and we know how difficult these cases are, and particularly when you get into the dual-use technology area.

Our next witness is John O'Neill, Chief, Counterterrorism Section of the Federal Bureau of Investigations. Mr. O'Neill?

TESTIMONY OF JOHN P. O'NEILL, SUPERVISORY SPECIAL AGENT, CHIEF, COUNTERTERRORISM SECTION, FEDERAL BUREAU OF INVESTIGATION

Mr. O'NEILL. Thank you, Senator, and I thank all the members of the Committee for giving me the opportunity to address you today on the threat caused by the proliferation of nuclear, biological, and chemical weapons. I would also like to tell you about the measures which have been taken by the Federal Bureau of Investigations to detect, prevent, and respond to the use of nuclear, biological, and chemical weapons in the United States.

As we have heard here yesterday and today, special weapons proliferation concerns the spread of weapons of mass destruction and their delivery systems. The FBI is the primary agency for foreign counterintelligence and counterterrorism investigations within the United States.

The FBI has developed and coordinates a special weapons proliferation program in order to prevent malevolent use and/or proliferation of nuclear, biological, and chemical weapons in the United States. The program relies on proactive domestic programs, foreign counterintelligence investigations in the United States, criminal investigations, counterterrorism investigations, close coordination with the intelligence community, and international cooperation.

As we have seen in our recent investigations, the ramifications of a terrorist act committed in the United States are great. The potential for the loss of life and damaging psychological effects from a terrorist attack in the United States involving a nuclear, biological, or chemical weapon are even greater. Simply put, we cannot afford one such attack.

Fortunately, to date, our investigations in the United States reveal no intelligence that rogue nations using terrorism, international terrorist groups, or domestic groups are planning to use these deadly weapons. We remain vigilant, however, to the possibility of nuclear, biological, and chemical terrorism by pursuing intelligence and counter-terrorism programs that are well coordinated and well exercised.

Our first goal is to prevent such an incident from occurring. Secondly, we must ensure we have the capabilities to respond swiftly and decisively should an attack occur.

I would like to speak first about the threat of nuclear terrorism. Within the past few years, there have been hundreds of reports of international smuggling and trafficking incidents involving nuclear materials around the world. The FBI has been involved in numerous assessments of threats of nuclear-related threats and smuggling investigations and nuclear material trafficking investigations around the world, working with the Customs Service and the intelligence community. In evaluating these threats, to date, there are no known instances where nuclear weapons or weapons-grade materials have actually existed or been purchased in the United States. However, the FBI continues to investigate vigorously all allegations relating to nuclear threats within our jurisdiction.

One of our most recent successful initiatives in the area was the FBI-sponsored International Law Enforcement Conference on Nuclear Smuggling, held from April 18 through 20 of this year at the FBI Academy at Quantico. Among the 150 participants were law enforcement representatives from 23 countries, including the Russian Federation and the newly independent states.

This conference displayed unparalleled cooperation between law enforcement and intelligence entities and culminated in an invaluable exchange. The exchange included the examination of the international criminal problem of nuclear smuggling and trafficking and its counterintelligence and terrorism implications.

With regard to nuclear terrorism, it is acknowledged that the production of a nuclear weapon would entail considerable technical experience, expertise and funding, thereby lessening the likelihood of an incident at this time.

The ability of terrorists to obtain and employ chemical and biological agents, however, is no longer subject to speculation. The sarin gas attack in Japan earlier this year, allegedly carried out by the Aum Shinrikyo sect, crossed the threshold with the use of a nerve agent to attack a civilian population.

In responding to the March 20, 1995, attack in the Tokyo subway system, the FBI opened a criminal investigation based upon a violation of Title 18, United States Code, Section 2331, which authorizes FBI extraterritorial investigations. As a result, we dispatched FBI agents to Japan. We have extraterritorial jurisdiction in this matter because two American citizens were victims of the sarin attack. Thankfully, both of them survived their injuries. The FBI is unable to confirm any additional investigations of the Aum Shinrikyo sect, if any, at this time because it would be classified information.

Despite the fact that conventional methods of attack are the proven choice of terrorist organizations to date, the use of chemical and biological weapons or agents can no longer be ruled out. As the sarin gas attack in Tokyo demonstrated, other groups may be inspired to employ chemical and biological weapons for future terrorist attacks due to the worldwide attention the Japanese attacks received.

Low production costs, ease of concealment and lethality make some CB agents possible terrorist weapons. Due to the relative ease with which CB weapons could be acquired or constructed by a terrorist or terrorist group, the FBI remains vigilant to that possibility through our active investigations and close coordination with the intelligence community.

In consideration of the magnitude and potential catastrophic consequences of the use of such a weapon, the FBI aggressively pursues countermeasures programs and the readiness to respond to and mitigate the consequences of such an attack.

However, the only documented actual chemical-biological attack in the United States involved the use of a biological agent which occurred in Oregon in 1984, when two members of a sect produced and disbursed salmonella bacteria in restaurants in order to affect the outcome of a local election. Seven-hundred-and-fifteen persons were affected. Fortunately, there were no fatalities.

The FBI recently concluded a case involving subjects who have manufactured ricin, which is a deadly poison derived from castor bean seeds. This extremely toxic poison is easily prepared and all of the materials necessary to produce it, as well as the instructions on its production, were acquired from publicly-available sources.

The four individuals investigated for producing the ricin espoused extreme anti-government, anti-tax ideals and advocated the violent overthrow of the U.S. Government. They had specifically targeted a deputy U.S. Marshal who had previously served papers on one of them for a tax violation, as the victim to be poisoned with ricin. To carry out the poisoning, the subjects mixed the ricin with a solvent which would allow its absorption into the blood stream. They conspired to smear the ricin mixture on doorknobs or on car steering wheels in order to poison their victim.

The FBI intervened in time to prevent this attack. This case is the first biological weapons investigation brought to trial and successfully prosecuted under the Biological Weapons Antiterrorism Act of 1989. On February 28 of this year, two of the defendants in the case were found guilty, having been named as principals in the ricin poisoning conspiracy. Two additional subjects involved were just convicted on October 25 for a violation of Title 18, United States Code, Section 175, naming them as co-conspirators in this act.

There is a valid concern over the relative ease with which biological materials and chemical precursors can be obtained. For example, in May of 1995, an individual is alleged to have acquired three vials of Yersina Pestis, the organism which causes bubonic plague, from a biological material supply company. The material was recovered, unopened, by law enforcement officials, and the individual was arrested and charged with fraud.

On June 27, the individual was indicted by a Federal grand jury on three counts of fraud by wire for opening an account by phone, faxing a letterhead memorandum with a fraudulent Environmental Protection Agency number thereon, and ordering the three vials of bacteria. Those vials had been shipped by Federal Express delivery service.

To date, these are the only cases involving the potential use of biological agents that the FBI has investigated where prosecution has been sought. On recent occasions, the FBI has responded to communicated threats of nuclear, biological, and chemical terrorist attacks. These responses include the initiation of our threat credibility assessments in accordance with the guidelines set forth in our operational, nuclear, biological, and chemical incident contingency plans.

The threat credibility assessment process, entailing coordination with the other entities in the U.S. Government to examine available information on the threat and determine its viability from a technical, operational, and behavioral standpoint, is very critical. To date, all of these alleged threats have been determined to be hoaxes.

As the lead Federal agency in responding to acts of terrorist or criminal-related nuclear-biological-chemical incidents in the United States, the FBI has taken many actions in order to deal with this emerging threat.

For example, we have developed and maintained a crisis management plan to respond to a domestic nuclear-biological-chemical terrorist threat or incident, to include procedures for assessing threat credibility, operational Federal law enforcement response, notifying pertinent agencies, and deploying the necessary technical resources to assist FBI field operations and local authorities in investigating, containing, and minimizing the consequences of the threat.

Operational plans for responding to a CB terrorist threat or incident are delineated in the FBI's chemical-biological incident contingency plan, and for a nuclear or radiological threat or incident, in our nuclear incident response plan. These plans, which have been in effect since the 1980s, are continually updated and revised, most recently in June of this year.

The contingency plans have been constructed to provide a blueprint for Federal law enforcement crisis response to nuclear, biological, and chemical threats or incidents. These plans outline and clarify the operational procedures that we will follow if faced with this threat or incident.

The plans are also designed to marshall the appropriate Federal tactical, technical, scientific, and medical support to bolster the FBI's investigative and crisis management abilities and to augment local and State resources in addressing the threat inherent in one of these incidents. The contingency plans emphasizes coordination between all participants and these plans are particularly concerned with the bridge between the law enforcement crisis management activities and the management of the consequences of the crisis.

The first priority of all these plans is the public safety and the preservation of life. In a terrorist or criminal-related incident, the FBI will assume the lead investigative and crisis management role, in association with local law enforcement authorities, to successfully resolve the incident.

Based on the specific details of the incident, law enforcement responsibilities will be resolved or no longer a priority and the Federal Emergency Management Agency will subsequently assume consequence management responsibilities for the incident. The FBI's nuclear, biological, and chemical incident contingency plans clarify and address this issue and provide guidance regarding the Federal management transition from the FBI to FEMA in this context.

Earlier this year, the FBI headquarters tasked all of its 56 domestic field offices to conduct a chemical-biological terrorism exercise in each of their regions in accordance with the guidelines set forth in our contingency plan. This includes coordination and participation by other public safety agencies who would be involved in an incident of this magnitude. This includes first responders, regional offices of supporting Federal agencies, and State emergency management agencies who would be involved in the consequence management of such an incident. Each of our 56 field offices has taken action in response to this tasking and are in the process of planning and conducting CB exercises at the local level.

Through vigilance in our investigations and the active cooperative exchanges with the intelligence community, we remain alert for terrorist intentions to acquire or employ weapons of mass destruction. We continue to improve our capabilities to respond to threats of nuclear, biological, and chemical weapons through active coordination with supporting Federal agencies. We continue to develop, plan, and deliver NBC-related training for our personnel. We continue the analysis of exercises conducted to date, which have been devoted to crisis management of nuclear, biological, and chemical threats and continue to develop new exercises.

In conclusion, the FBI continues to be vigilant in both its intelligence collection and analysis to prevent an NBC incident and in our plans for a response should an NBC incident occur in the United States.

[Prepared Statement of Mr. O'Neill]

PREPARED STATEMENT OF MR. O'NEILL

Mr. Chairman, thank you for the opportunity to address your Subcommittee on the threat caused by the proliferation of nuclear, biological, and chemical (NBC) weapons. I'd also like to tell you about the measures which have been taken by the Federal Bureau of Investigations to detect, prevent, and respond to the use of NBC in the United States.

As you know, special weapons proliferation concerns the spread of weapons of mass destruction (WMD) and their delivery systems. The FBI is the primary agency for foreign counterintelligence and counterterrorism investigations within the United States. The FBI has developed and coordinates a special weapons proliferation program in order to prevent the malevolent use and/or proliferation of WMD, including nuclear, biological, and chemical weapons in the United States. The program relies on proactive domestic programs, foreign counterintelligence investigations in the United States, criminal investigations, counterterrorism investigations, close coordination with the intelligence community, and international cooperation.

As we have seen in our recent investigations, the ramifications of a terrorist act committed in the United States are great. The potential for the loss of life and damaging psychological effects from a terrorist attack in the United States involving NBC are even greater. Simply put, we cannot afford one such attack. Fortunately, to date, our investigations in the United States reveal no intelligence that rogue nations using terrorism, international terrorist groups, or domestic groups are planning to use these deadly weapons. We remain vigilant, however, to the possibility of NBC terrorism, by pursuing intelligence and countermeasures programs that are well coordinated and well exercised. Our first goal is to prevent such an incident from occurring. Second, we must ensure we have the capabilities to respond swiftly and decisively should an attack occur.

I'd like to speak about the threat of nuclear terrorism first.

Within the past few years, there have been hundreds of reports of international smuggling and trafficking incidents involving nuclear material. The FBI has been involved in numerous nuclear smuggling investigations. In evaluating this threat date, there are no known instances where such nuclear weapons or weapons-grade nuclear materials have actually existed or been purchased in the United States. However, the FBI continues to investigate vigorously all allegations related to nuclear threats within our jurisdiction.

One of our most recent successful initiatives in the area was the FBI-sponsored International Law Enforcement Conference on Nuclear Smuggling, held from April

18 to April 20, 1995, at the FBI Academy. Among the 150 participants were law enforcement representatives from 23 countries, including the Russian Federation and the newly independent states. This conference displayed unparalleled cooperation between law enforcement and intelligence entities and culminated in an invaluable exchange, where participants examined the international criminal problem of nuclear smuggling and its counterintelligence and terrorism implications.

With regard to nuclear terrorism, it is acknowledged that the production of a nuclear weapon would entail considerable technical expertise and funding, thereby lessening the likelihood of such an incident at this time.

The ability of terrorists to obtain and employ C/B agents, however, is no longer subject to speculation. The sarin gas attacks in Japan earlier this year, allegedly carried out by the Aum Shinrikyo, crossed the threshold with the use of a nerve agent to attack a civilian population. In response to the March 20, 1995 attack in the Tokyo subway system, the FBI opened a criminal investigation based upon a violation of Title 18, U.S. Code, Section 2331, which authorizes FBI extraterritorial investigation. As a result, we dispatched FBI agents to Japan. We have extraterritorial jurisdiction in this matter because two American citizens were victims of the sarin gas attack. Thankfully, both of them survived their injuries. The FBI is unable to confirm any additional investigations, if any, as this would be classified information.

Despite the fact that conventional methods of attack are the proven choice of terrorist organizations to date, the use of a C/B weapon or agent can no longer be ruled out, as the sarin gas attack in Tokyo demonstrated. Other groups may be inspired to employ C/B weapons for future terrorist attacks due to the worldwide attention the Japanese attacks received.

Low production cost, ease of concealment, and lethality make some C/B agents possible terrorist weapons. Due to the relative ease with which C/B weapon could be acquired or constructed by a terrorist or terrorist group, the FBI remains vigilant to that possibility through our active investigations and close coordination with the intelligence community. In consideration of the magnitude and potential catastrophic consequences of the release of such a weapon, the FBI aggressively pursues countermeasures programs and the readiness to respond to and mitigate the consequences of, such an attack.

However, the only documented C/B attack in the United States involves the use of a biological agent, which occurred in Oregon in 1984, when two members of a sect produced and disbursed salmonella bacteria in restaurants in order to affect the outcome of a local election. Seven-hundred-and-fifteen persons were affected; fortunately, there were no fatalities.

The FBI recently concluded a case involving subjects who had manufactured ricin, which is a deadly poison derived from castor bean seeds. This extremely toxic poison is easily prepared, and all of the materials necessary to produce it, as well as the instructions on its production, were acquired from publicly available sources. The four individuals investigated for producing the ricin espoused extreme anti-government, anti-tax ideals, and advocated the violent overthrow of the government. For the ricin poisoning, they had specifically targeted a deputy U.S. Marshal who had previously served papers on one of them for tax violations. To carry out the poisoning, the subjects mixed the ricin with a solvent which would allow its absorption into the bloodstream. They conspired to smear the ricin mixture on doorknobs or steering wheels in order to poison their victim.

The FBI intervened in time to prevent the attack. This case is the first biological weapons investigation brought to trial and successfully prosecuted under the Biological Weapons Antiterrorism Act of 1989. On February 28, 1995, two of the defendants in the case were found guilty under Title 18, U.S. Code, Sections 175 and 2, naming them principals in the ricin poisoning conspiracy. Two additional subjects involved were just convicted on October 25, 1995, for violation of Title 18, U.S. Code, Section 175 and 371, naming them co-conspirators.

There is a valid concern over the relative ease with which biological materials and chemical precursors can be obtained. For example, in May 1995, an individual is alleged to have acquired three vials of Yersina Pestis, the organism which causes bubonic plague, from a bio-medical supply company. The material was recovered, unopened, by law enforcement officials, and the individual was arrested and charged with fraud. On June 27, 1995, the individual was indicted by a Federal grand jury on three counts of fraud by wire for opening an account by phone, faxing a letterhead memo with an fraudulent Environmental Protection Agency number and ordering the three vials, which had been shipped via Federal Express.

To date, these are the only cases involving the potential use of biological agents that the FBI has investigated where prosecution has been sought. On recent occasions, the FBI has responded to communicated threats of NBC terrorist attacks: to include the initiation of threat credibility assessments in accordance with guidelines set forth in our operational NBC contingency plans. The threat credibility assessment process entails coordination with other entities in the U.S. Government to examine available information on the threat and determine its viability from a technical, operational, and behavioral standpoint. To date, all of these alleged threats have been determined to be hoaxes.

As the lead law enforcement agency in responding to acts of NBC terrorism or criminal-related NBC incidents in the United States, the FBI has taken many actions in order to deal with this emerging threat. For example, we have developed and maintain crisis management plans to respond to a domestic NBC terrorist threat or incident, to include procedures for assessing threat credibility, operational Federal law enforcement response, notifying pertinent agencies, and deploying the necessary technical resources to assist FBI field operations and local authorities in investigating, containing, and minimizing the consequences of the threat.

Operational plans for response to a C/B terrorist threat or incident are delineated in the FBI's C/B incident contingency plan; and, for a nuclear or radiological threat or incident, the nuclear incident response plan. These plans, which have been in effect since the late 1980's, are continually updated and revised, most recently, in June, 1995. The contingency plans have been constructed to provide a blueprint for a Federal law enforcement crisis management response to an NBC incident. These plans outline and clarify the operational procedures that we will follow if faced with an NBC threat or incident.

The plans are also designed to marshall the appropriate Federal tactical, technical, scientific, and medical support to bolster the FBI's investigative and crisis management abilities and to augment local and State resources in addressing the threat inherent in an NBC incident. The contingency plans emphasize coordination between all participants and are particularly concerned with the bridge between the law enforcement crisis management activities and the management of the consequences of the crisis.

The first priority of the plans are public safety and the preservation of life. In a terrorist or criminal-related NBC incident, the FBI will assume the lead investigative and crisis management role, in association with local law enforcement authorities, to successfully resolve the incident.

Based on the specific details of an incident, law enforcement responsibilities will be resolved or no longer a priority, and the Federal Emergency Management Agency (FEMA) will subsequently assume consequence management responsibilities for the incident. The FBI's NBC incident contingency plans clarify and address this issue and provides guidance regarding the Federal management transition from the FBI to FEMA in this context.

Earlier this year, FBI headquarters tasked the 56 domestic FBI field offices to conduct C/B terrorism exercise in each of their regions in accordance with the guidelines set forth in the C/B incident contingency plan. This includes coordination and participation by other public safety agencies who would be involved in a C/B incident; including first responders, regional offices of supporting Federal agencies, and State emergency management agencies who would be involved in the consequence management of such an incident. Each of the 56 field offices has taken action in response to this tasking and are in the process of planning and conducting C/B exercises.

Through vigilance in our investigations and active cooperative exchanges with the intelligence community, we remain alert for terrorist intentions to acquire or employ weapons of mass destruction. We continue to improve our capabilities to respond to threats of NBC through active coordination with supporting Federal agencies. We continue to develop, plan, and deliver NBC-related training for our personnel. We continue the analysis of exercises conducted to date, which have been devoted to crisis management of NBC threats and continue to develop new exercises.

In conclusion, the FBI continues to be vigilant both in its intelligence collection/analysis to prevent an NBC incident, and in our plans for a response should an NBC incident occur in the United States.

Senator NUNN. Thank you, Mr. O'Neill.

Next is Allen Holmes, Assistant Secretary of Defense, Special Operations and Low Intensity Conflict of the Department of Defense.

Mr. Holmes, I know you have to leave at about 12:40. Dr. Young, you are next and we will hear your testimony before we get into questions, but I would ask the members of the panel if they have questions for Mr. Holmes, I think we should start with those since he has notified us in advance that he has to leave. After we complete the testimony, we will start with your questions, and I would hope, given the time, that you could both summarize in 8 to 10 minutes, if you could.

TESTIMONY OF H. ALLEN HOLMES, ASSISTANT SECRETARY OF DEFENSE, SPECIAL OPERATIONS AND LOW INTENSITY CONFLICT, U.S. DEPARTMENT OF DEFENSE

Mr. HOLMES. Thank you, Mr. Chairman. I will summarize the highlights of my statement.

You have heard testimony on the low cost, easy availability of the components, relatively low technical skills required, and the difficulty in detecting chemical and biological weapons. A dedicated effort by a terrorist organization could possibly lead to the catastrophic scenario depicted by many efforts. There is no denying that the threat is real and that the Department of Defense and all Federal agencies are treating chemical and biological weapons use as a very serious possibility.

But it should be kept in perspective. We should note that the Aum Shinrikyo attack was the most sophisticated attempt by a large, well-organized group employing a battery of qualified scientists, utilizing advanced technical equipment and facility infrastructure and supported by considerable financial assets. Despite these highly-favorable factors, the effectiveness of Aum Shinrikyo's attack was less than might have been predicted.

What the Tokyo attacks of March 1995 and the Matsumoto attack of June 1994 do demonstrate, however, is that a radical group bent on employing chemical or biological agents can recruit the type of scientific expertise required, acquire materials necessary to conduct such a campaign, and attempt to stage the event. As terrorists learn from past mistakes and gain experience in the weapons, the next attack could have far worse consequences.

The tougher issue in many respects is the psychological problem of public fear resulting from the use of a chemical or biological agent. The fear generated by such an attack may pose more difficult problems even than the physical threat itself. The public must be made aware that chemical and biological agents have limitations and their effectiveness can be mitigated by several methods.

These agents present difficult challenges, but the Federal Government is working hard to deter, prevent, and minimize their effects and provide effective consequence management. We believe that with proper planning, coordination, focused research and development, and intelligence support, and the active participation of State and local authorities, our Government can respond to this threat.

DoD's combatting terrorism program is part of a coordinated U.S. Government interagency team response. Several members of our team are here today. No single Federal agency possesses the authorities, response mechanisms, and capabilities to effectively deter and resolve terrorist incidents. The U.S. Government program is based on the lead agency concept, with the Department of State exercising lead agency responsibility overseas and the Department of

Justice exercising lead agency responsibility for domestic incidents. The Department of Defense provides a significant supporting role to whichever lead agency is involved.

We in DoD divide combatting terrorism into two components, antiterrorism and counterterrorism. Antiterrorism means the defensive measures employed to protect personnel and facilities against a terrorist incident. Conversely, counterterrorism refers to our offensive capabilities.

It is DoD policy to protect its people, family members, facilities, and equipment from terrorist acts. Toward that end, we routinely budget for security at military installations and DoD independent schools.

To highlight antiterrorism awareness and importance, my office sponsors an annual DoD Worldwide Antiterrorism Conference, which serves as a forum for exchange of ideas among DoD and other U.S. Government specialists. We also have an awards program. We established it a couple of years ago to recognize those who work quietly behind the scenes to protect DoD personnel, installations, and their families.

The second part of the Department's combatting terrorism program is counterterrorism. This includes DoD's support for U.S. policy to deter, defeat, and respond vigorously to all terrorist attacks against U.S. interests wherever they may occur. DoD supports the initiatives of the lead agencies in carrying out U.S. counterterrorism policy. For example, our office supports the State Department Coordinator for Counterterrorism in consultations with foreign governments, the deployment of emergency support teams at the request of an American ambassador to assist the host government, and the Department of Justice in the extradition or rendition of terrorist suspects.

DoD also largely funds the technical support working group responsible for the research and development of counterterrorism technologies as U.S. DoD counterterrorism response capabilities are routinely exercised from the tactical to the national level. DoD special mission units frequently train and exercise with foreign counterterrorism units.

Domestically, DoD forces serve in a support capacity to law enforcement agencies, providing technical and operational support upon request. Whether supporting lead agency efforts or receiving assistance which enhances tactical capabilities from other Government agencies, DoD is an integral part of a well-organized and functional U.S. counterterrorism community.

Looking specifically at how we would manage a terrorist incident involving either a chemical or biological weapon, it is important to note that the interagency group combatting terrorism separates the two threats. Should a chemical or biological threat occur, DoD can respond with special mission units, response teams to provide specialized laboratory assistance and help with consequence management tailored to meet the individual incident.

Looking at steps we are currently taking, DoD is conducting a series of senior-level interagency tabletop exercises focused on weapons of mass destruction. The next two exercises will deal in large measure with biological weapons in a domestic scenario, aimed toward security preparations for the 1996 Atlanta Olympics.

The interagency CT community is also refining its procedures to include consequence management in weapons of mass destruction incident resolution. The inclusion of FEMA and the Public Health Service in the crisis and consequence management of terrorist weapons of mass destruction events is a critical and important new step by the interagency community.

Another program is the technical support working group, which provides fast track research and development of counterterrorism equipment. This group is currently looking at six projects aimed specifically at enhancing response capability for a chemical or biological incident. Recently, we began a review of many other projects to ascertain whether accelerating any of these with additional funding could bring equipment on line more quickly for use by our response units. A key area where DoD is making progress in fighting chemical and biological weapons is in detection technology.

Mr. Chairman, we are confident of our ability to respond quickly to terrorist acts. There remain many technical challenges in responding to the use of chemical and biological weapons, and I assure you that the interagency counterterrorism community is working hard each day to solve those challenges. We are committed to working closely with you and with the State and local authorities to see that the American people are protected against the menace of international terrorism wherever and whenever it may arise. Thank you.

[The prepared statement of Mr. Holmes follows:]

PREPARED STATEMENT OF MR. HOLMES

Thank you, Mr. Chairman for this opportunity to discuss with you the Department of Defense's (DoD) role in Combatting Terrorism and how it addresses the threat of chemical and biological weapons used by terrorists. Among my duties as the Assistant Secretary of Defense (Special Operations and Low-Intensity Conflict), I serve as the Principal Staff Assistant and civilian advisor to the Secretary of Defense for policy and planning related to combatting terrorism. These hearings provide a positive step in educating the public on the nature of the threat and how the U.S. Government will respond. I would like to organize my remarks in the following manner: first, to address the reality of the threat; second, to give a general overview of DoD's Combatting Terrorism program; and finally to discuss the specific measures DoD is taking toward countering the potential use of chemical and biological weapons by terrorists.

You have heard testimony on the low cost, easy availability of components, relatively low technical skills requirement, and difficulty in detecting chemical and biological weapons. A dedicated effort by a terrorist organization could possibly lead to the "catastrophic scenario" depicted by many experts. There is no denying that the threat is "real" and that DoD, and all Federal agencies, must treat chemical and biological weapons use as a very serious possibility. But it should be kept in perspective. We need to note that the Aum Shinrikyo attack was a most sophisticated attempt by a large, well organized group employing a battery of qualified scientists, utilizing advanced technical equipment and facility infrastructure, and supported by considerable financial assets. Despite these highly favorable factors, the effectiveness of Aum Shinrikyo's attack was less than might have been predicted. what the Tokyo attacks of March 1995 and the Matsumoto attack of June 1994 do demonstrate, however, is that a radical group bent on employing chemical or biological agents can recruit the type of scientific expertise required, acquire materials necessary to conduct such a campaign, and attempt to stage the event. As terrorists learn from past mistakes and gain experience in the weapons, the next attack could have far worse consequences.

The ability to create mass casualties by using chemical and biological weapons depends on many factors. Finding the right agent, weaponizing the agent, delivering the agent in an effective manner, and waiting for the optimal metrological conditions would be a challenge to any terrorist group. We just need to keep in perspective the reality of recent and potential events.

The tougher issue involved was the psychological problem of public fear resulting from the use of a chemical agent. The fear generated by such an attack may pose far more difficult problems than the physical threat itself. The public must be made aware that chemical and biological agents have many limitations and their effectiveness can be mitigated by several methods. These agents present difficult challenges, but the U.S. Government is working hard to deter, prevent, and/or minimize the effects and provide effective consequence management. We believe with proper planning, coordination, focused research and development, and intelligence support, the U.S. Government can respond to this threat.

DoD's Combatting Terrorism program is part of a coordinated U.S. Government interagency team response. No single federal agency possesses the authorities, response mechanisms and capabilities to effectively deter and resolve terrorist incidents. The U.S. Government program is based on a "lead agency" concept with the Department of State exercising lead agency responsibility overseas and the Department of Justice exercising lead agency responsibility for domestic incidents. The Department of Defense provides a significant supporting role to the lead federal agency.

Overseas, working with the State Department, DoD plays a vital role from initial planning through implementation of a wide range of overseas activities to include military to military cooperation, assistance, training, and joint exercises. Under the lead of the Department of Justice-and the FBI, DoD works closely with its domestic counterparts, not only to provide cooperation or assistance permitted under law but also to ensure that DoD personnel and facilities are protected against any possible terrorist threat.

The Department of Defense is mandated by law, executive order, and Presidential Directive to have an effective Combatting Terrorism Program. In November 1988, the Secretary of Defense designated the Office of the Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict [OASD(SO/LIC)] as the office responsible for DoD policy and oversight on combatting terrorism. Since its inception, SO/LIC has represented DoD as a key member of the U.S. Government's interagency counterterrorism effort. We routinely meet with our colleagues from the other federal agencies (several of whom are represented on this panel) to discuss, plan, and coordinate the U.S. Government response to terrorism. This interagency combatting terrorism team has been in existence since the mid-1980s.

We, in DoD, divide Combatting Terrorism into two components, Antiterrorism (AT) and Counterterrorism (CT). Antiterrorism means the defensive measures employed to protect personnel and facilities against a terrorist incident. Conversely, counterterrorism refers to our offensive capabilities.

It is DoD policy to protect its personnel, their family members, facilities, and equipment from terrorist acts. Toward that end, DoD routinely budgets for security at military installations and DoD Dependent schools. To assist in the AT effort, OASD(SO/LIC) published DoDD 0-2000.12 (DoD Combatting Terrorism Program) in August 1990. This directive assigns specific responsibilities to various DoD elements for briefing personnel on any known or suspected terrorist threats and informs them of security measures to be taken. It also directs prompt dissemination of intelligence information (to those charged with security responsibilities) on terrorist threats, including specific threats against DoD personnel and their family members.

Additionally, OASD(SO/LIC) published DoD 0-2000.12-H (Protection of DoD Personnel and Activities Against Acts of Terrorism and Political Turbulence) in February 1993, a handbook that serves as a comprehensive reference book for all DoD components on antiterrorism awareness, education, and training activities.

To highlight AT awareness and importance, OASD(SO/LIC) sponsors an annual DoD Worldwide Antiterrorism Conference which serves as a forum for DoD and other U.S. Government antiterrorism specialists from throughout the United States and abroad to identify key issues and to reach consensus on possible solutions. The ASD(SO/LIC) also established an awards program in 1993 to recognize and praise those who work quietly behind the scenes to protect DoD personnel and installations; sensitize U.S. Military and their families to the nature and dangers of terrorism; and deter and prevent terrorist acts.

DoD also provides antiterrorism training. In this regard DoD complements the Department of State's program for Antiterrorism Training Assistance by providing training to foreign military counterparts which may take the form of small unit exchanges or participation in joint training and exercises. A detailed accounting of the training that is provided to foreign governments is discussed in the DoD portion of the classified State Department's Annual Antiterrorism Report to the Congress.

This report is mandated under provisions of the Omnibus Diplomatic Security and Antiterrorism Act of 1986.

DoD also works routinely with the Department of State in distributing travel advisories for DoD members and families. DoD follows the U.S. Government policy on "no double standard" regarding availability of threat information. This dictates that American Government officials cannot benefit from information which might equally apply to the public but is not available to the public.

The second part of the Defense Department's Combatting Terrorism program is Counter-terrorism. This includes Defense Department support for U.S. policy to deter defeat and respond vigorously to all terrorists attacks against U.S. interests wherever they may occur. DoD supports the initiatives of the lead agencies in carrying out U.S. counterterrorism policy. For example, our office supports the State Department's Coordinator for Counter Terrorism in consultations with foreign governments the deployment of Emergency Support Teams at the request of an American Ambassador to assist the host government, and the Department of Justice in the extradition or rendition of terrorist suspects. DoD also largely funds the Technical Support Working Group responsible for the research and development of CT technologies.

While it is DoD's policy not to discuss the capabilities, designations, missions and locations of DoD counterterrorism special units in a public forum, I would like however, to briefly outline how DoD responds to a terrorist incident. During such an incident, the ASD(SO/LIC) has two primary roles. He is the Secretary's principal civilian advisor. He also serves as the Secretary's representative to the interagency crisis coordinating body, which will handle the counterterrorism response. The Joint Staff provides a representative as well. The ASD(SO/LIC) provides policy advice while the Joint Staff representative provides operational comment and advice.

U.S./DoD counterterrorism response capabilities are routinely exercised from the tactical to the national level. DoD special mission units frequently train and exercise with foreign CT units. Domestically, DoD forces serve in a support capacity to law enforcement agencies, providing technical and operational support upon request. whether supporting lead agency efforts or receiving assistance which enhances tactical capabilities from other government agencies, DoD is an integral part of a well organized and functional U.S. counterterrorism community.

Looking specifically at how we would manage a terrorist incident involving either a chemical or biological weapon, it is important to note that the interagency combatting terrorism community separated the two threats. The interagency community recognized long ago that while chemical and biological agents may have some common points, the production means, delivery vehicle, countermeasures, and expertise were based on completely different criteria. Clearly, in any effort to resolve a terrorist incident, we would want to rely on expertise most familiar with the specific threat. Therefore to eliminate confusion and to focus our efforts, we elected to treat them as separate and distinct threats. Should a chemical or biological threat occur, DoD can respond with special mission units, response teams, provide specialized laboratories, and assist with consequence management assets tailored to meet the individual Incident.

Finally, looking at what steps we are currently taking to handle chemical and biological incidents-and prevent the proliferation of such weapons, there are a number of efforts that should be highlighted. Within the combatting terrorism program, DoD is conducting a series of senior level interagency tabletop exercises focused on weapons of mass destruction. The next two exercises will deal in large measure with biological weapons in a domestic scenario aimed toward security preparations for the 1996 Atlanta Olympics. DoD is refining the process through which it will provide military assistance to civil authorities to encompass procedures specifically designed to handle weapons of mass destruction in a domestic scenario. The interagency CT community is also refining its procedures to include consequence management in weapons of mass destruction incident resolution. The inclusion of FEMA and Public Health Service in the crisis and consequence management of terrorist WMD events is a critical and important new step by the interagency community.

Another program within the interagency CT community is the Technical Support Working Group (TSWG) which provides fast-track research and development of CT equipment. The TSWG is currently engaged in six projects aimed specifically at enhancing response capability for a chemical or biological incident. Recently, we began a review of all TSWG projects to ascertain if accelerating any of these projects with additional funding could bring equipment on-line more quickly for use by our response units.

A key area where DoD is making progress in fighting chemical and biological weapons is in detection technology. There are systems currently fielded or in production for conventional military missions which may support counterterrorism efforts as well. For example, there is currently a system which can detect surface chemical contamination and another which can detect and provide an alarm if the air is contaminated. Other systems are under development for chemical detection within a specific setting. For example the aircraft interior detector is designed to detect, identify, and warn of low levels of nerve or blister agents in vapor form. Such a system could also be used in subway stations. Similar capabilities are being developed for biological agents. There are also integration systems designed to link point detectors as a network so that contamination occurring at multiple sites can be detected at a central location. The Marine Corps is looking at software packages designed to incorporate detection and meteorological information to track the dispersal of chemical contaminations. This system is being looked at for possible use at the 1996 Atlanta Olympics. DoD is also investigating new technology for individual protection (new suits and accessories) as well as decontaminates, post-exposure medications, and vaccines.

We are working closely with other nations on a bilateral and multilateral basis to halt and/or prevent the proliferation of weapons of mass destruction. U.S. Government Policy is directed toward stemming chemical and biological weapons proliferation. We have identified key chemical precursors, biological pathogens, and nuclear materials used in development of these weapons, and are using those precursors to establish databases to monitor, deter, and if necessary take action against those states or groups involved in chemical or biological weapons development. The President has issued three recent Decision Directives (PDD) on nonproliferation, nuclear safety, and counterterrorism designed to increase U.S. Government efforts toward preventing proliferation.

There are several treaties dealing with chemical and biological weapons, in addition to the multilateral efforts to control products which are specifically needed to build such programs or the missiles that might deliver them. Within the interagency CT community, we have agreements with friendly nations to jointly develop equipment for combatting terrorism. Some of these efforts are aimed at the chemical and biological threat. Additionally, the interagency community is making every effort to enlist the aid of our allies and other nations to coordinate response capabilities for incidents involving weapons of mass destruction.

Mr. Chairman, we are confident of our ability to respond quickly to terrorist acts. There remain many technical challenges in responding to the use of chemical and biological weapons and I assure you that the interagency CT community is working hard each day to solve those challenges. We are committed to working closely with you and with State and local authorities to see that the American people are protected against the menace of international terrorism wherever and whenever it may arise.

I am ready for your questions.

Senator NUNN. Thank you, Mr. Holmes.

Dr. Young?

TESTIMONY OF DR. FRANK E. YOUNG, M.D., Ph.D., DIRECTOR, OFFICE OF EMERGENCY PREPAREDNESS, PUBLIC HEALTH SERVICE

Dr. YOUNG. Thank you, Mr. Chairman.

As a physician who has worked in this field for over 20 years, I want to personally thank you and the Members of your Committee for the leadership in holding this important hearing to bring attention to the need to prepare better for the potential use of weapons of mass destruction by terrorism. These cowardly acts of terrorism affect not only our citizens but those around the world.

To facilitate your investigation, I would like to make eight quick points to summarize the portions of my testimony that may be relevant from a medical standpoint.

First, there are two major ways to minimize the impact of terrorism with weapons of mass destruction—prevention through the intelligence that you have heard described, including law enforcement, and disarmament conventions, and through preparation to ensure that a rapid response can be mounted to save lives and reduce human suffering. Regardless of the type of perpetrator, state-sponsored or independent, regardless of the means used, the consequences are the same. We need to be prepared for those consequences.

Second, those consequences are primarily health and medical, and environmental. Those are the two issues that we need to face.

Third, if I could have the first graphic put up (chart 1),[1] the attack can occur with or without warning. The attack in Tokyo, the one in the Trade Center, and the attack at Oklahoma City were without warning. The excellent interaction that we have had, as Mr. O'Neill described, between crisis and consequence management, brings together the ability of our teams to focus on terrorism threats. This chart illustrates the decision tree that we go through.

Fourth, FEMA is responsible for coordinating the Federal consequence management, through the Federal response plan as shown in the next graphic (chart 2). The portion in red that is shown there, health and medical services, is the portion that is the responsibility of the Department of Health and Human Services. Whether it be natural disasters or a terrorist attack, the same approach is used. Our lead partners are the Departments of Defense, Veterans Affairs, Agriculture, Transportation, and the Environmental Protection Agency, just to mention a few.

We are also supported by the private sector, which participates through the National Disaster Medical System. I am pleased to point out that we had three teams that responded to Hurricane Marilyn. There were teams from Georgia, Ohio, Boston, and others. There are over 5,000 individuals that can be called to duty, medical minute men and women that can respond and can go forth to serve those victimized by catastrophic natural disasters.

Fifth, the people who respond first to catastrophic disasters are our police, fire fighters, and emergency medical personnel. Daily, they risk their lives to protect us. They have vastly different risks in responding to bombs and to earthquakes as compared to biological and chemical weapons.

For example, though bombs and earthquakes can produce massive destruction, the medical responders are primarily dealing with injuries resulting from trauma. Who can forget the firemen carrying young children out of the bomb site at Oklahoma City? Medically, though, we are prepared to deal with this type of trauma and it is a relatively simple task compared to others.

Chemical weapons are more difficult to identify immediately. They can kill the first responders unless there is continuous and appropriate training, the appropriate safety equipment, and prompt identification of the chemical agent. As you know from your investigation, it took many hours for the Japanese physicians to identify the agent that was involved, and only intravenous fluid support was used until that time. In general, health and medical professionals are far less equipped to deal with the response to chemical agents.

Biological agents are usually not detected until symptoms appear and the disease has spread outside the area of the original attack zone. First responders are at high risk. Fortunately, the Centers for Disease Control and Prevention and the Food and Drug Administration have good networks with the private sector, the departments of health, industry, and consumer groups, to lead to early detection. Rapid diagnosis, determination of antibiotic susceptibility, establishment of disease surveillance, and obtaining sufficient supplies of antibiotics are essential ingredients to curtailing any outbreak.

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[1] The charts referred to appears at the end of Dr. Young's prepared statement.

Sixth, the major points of the response medically are shown on the next two charts (charts 15 and 16). I will just go through a few of them. The threat assessment and the consultation with the affected jurisdictions are key. Rapid identification of the agent is essential. The clinical medical support through health professionals, laboratory support, and the use of the National Disaster Medical System for patient evacuation and in-hospital care, as well as pharmaceutical capabilities are critical for our successful response.

Seventh, the overall strategy is shown in the final graphic (chart 7). The rapid development of threat assessment, emergency consultation, deployment of a rapid technical assistance team for chemical and biological terrorism, and additional support as required are the major features of the plan.

Finally, I would like to share with you some of the principles that we gleaned in our discussions recently with State and local officials. We have met with individuals from the Washington Metropolitan Council of Governments, the City of Boston, the Office of the Governor of Massachusettes and the State of California. We have involved our Disaster Medical Assistance Team leaders from San Diego and Atlanta in gleaning these principles as well.

We learned that public information is essential to avoid public panic. A readily-accessible joint information center, at local, State, and Federal levels, is key.

Second, awareness and training must be continuous. The fire fighters and other first responders emphasized that there is turnover in jobs and turnover in personnel. Thus, the training must be continuous and medical supplies must be there.

The concept of metro strike teams would be similar to the locally developed National Disaster Medical Assistance Teams. These metro strike teams would be on-site rapidly. There must be appropriate supplies and equipment for these teams.

It is important that communication capability and capacity are taken into account so that we can communicate in the early hours after an incident.

And finally, the local responder must be able to be supported in an integrated fashion between Federal, State, and local governments.

The risks are enormous when we consider the potential—and I emphasize potential—horrific consequences of a terrorist use of weapons of mass destruction. In conclusion, we must be better prepared and must better prepare our dedicated men and women who, as emergency responders, place their lives on the line as they rush into harm's way to protect the citizens of our great country. To do otherwise is unconscionable.

This concludes my formal comments. I tried to summarize them briefly for you. I would be happy to answer any questions I can, sir.

[The prepared statement of Dr. Young follows:]

PREPARED STATEMENT OF DR. YOUNG

Mr. Chairman and Members of the Subcommittee, thank you for inviting me here to discuss the global proliferation of weapons of mass destruction, and to provide a public health perspective to your deliberations. As a physician who has addressed these issues in the laboratory, as a government official managing the public health response to terrorism due to chemical poisonings from cyanide, and as the leader of health and medical consequence response in the Federal Response Plan (FRP) under the coordination of the Federal Emergency Management Agency (FEMA), I have been forced to wrestle with this problem from both a technical and a policy basis.

Your emphasis on these issues coincides with a Presidential decision to focus on terrorism because of the increasing terrorist capability and demonstrated use of weapons of mass destruction. In fact much of the action of the Department of Health and Human Services (HHS) is based on the Administration's policies in response to terrorism. It is important to note that there are significant differences among the non-lethal consequences of nuclear, biologic and chemical weapons of mass destruction, and we must be prepared for them.

Background

Chemical weapons of mass destruction, such as mustard, phosgene and chlorine, were first used in World War I, and again in isolated conflicts in the 1960's, 1970's, and 1980's. The Tokyo subway attack in 1995 and the information described recently in the press about the potential use of these agents in the Middle East during the Gulf War serve as grim reminders of the recent use of biologic and chemical agents as weapons of terrorism.

Biologic agents, like chemical agents, have been addressed in arms control conventions. However, unlike chemical and nuclear agents, the capability to combine biologic agents makes these agents extremely difficult to detect and monitor. Additionally, infectious organisms can multiply and spread to individuals outside the original site of attack and can be engineered to be resistant to multiple antibiotics.

An attack with weapons of mass destruction could occur with or without a known threat as shown in this chart (chart 1). When a threat occurs, the Federal Bureau of Investigation (FBI) leads the integrated Federal crisis management activities. In the case of weapons use without a prior threat, we would be faced with immediate public health consequences.

Crisis and Consequence Management

The Administration established policies to address both foreign and domestic terrorism. My remarks today will focus on the domestic issues only.

The Federal management of domestic crises is the responsibility of the FBI and has been addressed by Mr. O'Neil. FEMA and the other domestic departments and agencies work closely to support the FBI through their crisis management plan.

Specifically, HHS provides technical assistance in threat assessment and emergency consultation. The individuals who provide this assistance must be accessible for consultation within an hour of the request. HHS will also rapidly deploy individuals to supplement the FBI by on-site technical assistance. These experts would also be prepared to deal with consequence management if the need occurred. It is important to note that training and exercises are required to ensure roles are clearly known and the transition from crisis to consequence management occurs smoothly.

FEMA provides overall coordination for consequence management. The FRP, signed by 26 departments and agencies, established primary responsibilities for 12 Emergency Support Functions (ESF) as shown in this chart (chart 2). When the resources of the local and State governments are exhausted, and the President approves a Governor's request for a Federal Disaster Declaration, FEMA activates the FRP and tasks the primary departments and agencies to provide essential services through formal mission assignments.

HHS is responsible for ESF #8—the health, medical and health related social services support. There are 16 functions included within ESF #8 as illustrated in this chart (chart 3). I have just returned from the Virgin Islands where I led the ESF #8 response to Hurricane Marilyn. Our efforts included the provision of patient care, health support to FEMA managed centers, sanitation, assurance of safe food, potable water, disease surveillance, vector control, environmental health and mortuary services. This was a coordinated health response that included key support from the Operating Divisions of HHS, and the Departments of Defense (DoD) and Veterans Affairs (DVA).

An essential element in the response to both man-made and natural catastrophic disasters is the National Disaster Medical System (NDMS). This system is made up of four departments and agencies, with HHS as the lead, and includes DVA, DoD and FEMA. The NDMS has three major components: patient care, patient evacuation and patient in-hospital care. Patient care is provided by Disaster Medical Assistance Teams (DMATs). Currently, there are 60 DMATs in existence, as shown in charts 4 and 5 by State membership and deployment. Of these, 21 are level 1 teams that can mobilize within six hours, with supplies and equipment for 72 hours of operation. These level 1 teams are self-sufficient with tents, food and water purification equipment. During Hurricane Marilyn, the DMAT teams provided most of the health care for 2.5 weeks in the aftermath of the storm on St. Thomas, and supplemented care on St. Croix and St. Johns. DVA and DoD personnel also contributed significant support to the islanders during this time. Other major NDMS responses since 1989 are shown in chart 6.

Two types of disasters can occur without warning earthquakes and terrorism. In both instances there must be an immediate response, since the number of lives lost will, in large measure, be directly impacted by the rapidity of the immediate response capabilities. Weapons of mass destruction cause death, injury and environmental destruction. Because loss of life is the paramount concern, the immediate and initial focus on the impact of terrorism must be on the health and medical consequences and the capacity of the first responders to save lives.

Immediately after the Tokyo subway attack, the Coordinating Sub Group of the National Security Council tasked the Public Health Service to develop a plan of operation for the health and medical consequences of chemical and biologic terrorism. To begin to plan to meet these needs, in FY 1995, the Secretary of HHS allocated funds for the initial planning document. The Office of Emergency Preparedness (OEP), as the lead office in HHS, serves as chair and FEMA as the co-chair of the interagency committee to develop the immediate health and medical response to terrorism with biologic and chemical agents. Key departments and agencies involved include DoD, DVA, Environmental Protection Agency, U.S. Department of Agriculture, FBI, Department of Transportation, and the General Services Administration. The committee developed a draft interim plan that integrated the immediate health and medical responses of the Federal agencies in support of States and local governments (charts 7–10). A few key components of the plan deserve additional emphasis, including:

- Needs assessment for gaps in response capability;
- Planning, training and exercises are essential to prepare first responders;
- Metro strike teams trained and ready to cope with biologic and chemical agents are essential to support the first responders. These special NDMS teams in high risk metropolitan areas would be able to respond within 30 to 90 minutes (charts 11–13);
- Communication equipment and expertise is likely to be among the weakest links in the response. In the aftermath of the New York Trade Center and Oklahoma City bombings, there was an absence of communications capacity for about 3 hours. Effective communications will be essential in response to terrorism.
- Administration policy requires a review of the adequacy of NDMS. While the level 1 DMATs are appropriately placed for natural disasters (chart 14), there are deficiencies with respect to terrorism in large metropolitan areas.

Presidential Actions and Associated HHS Budget Request

The President requested that HHS support crisis management through technical assistance and development of a rapid deployment team, and consequence management, through the development of plans, identification of shortfalls in plans, and actions to remedy those shortfalls. Because HHS is the lead Federal department in the immediate aftermath of attack, specific attention was directed to the adequacy of NDMS to respond effectively and deficiencies in stockpiles of medicines.

In response to these additional responsibilities, the President amended the FY 1996 Budget to provide an additional $9 million to begin to plan for the health and medical consequences of domestic terrorism. This funding request was offset by decreases elsewhere in HHS, and was thus, budget neutral. Key elements of this request include:

- Initiating and coordinating integrated planning and evaluation activities with Federal, State and local authorities;
- Training health professionals, emergency responders and emergency managers, at the Federal, State and local levels, to augment the skills of personnel involved in medical response, early detection, surveillance, inspection, sample transportation and laboratory detection.
- Providing medical response coordination through additional medical, scientific and logistic personnel stationed in OEP and HHS regions who would provide

technical assistance, procure required antidotes and antibiotics, and establish the medical support unit to coordinate the emergency response (charts 15 and 16).
- Enhancing warning and detection systems to reduce the severe consequences of these destructive agents through rapid medical diagnosis.
- Providing increased capability to identify organisms and identify chemical agents in order to quickly identify and provide the appropriate medical treatment to minimize the morbidity and mortality from a chemical/biological agent.
- Enhance medical and epidemiologic public health activities to be prepared to deal with the public health consequences of a terrorist attack.
- Building and activating four metropolitan strike teams who would be specially trained to meet the needs of patients in high risk communities with health problems related to weapons of mass destruction.

Public Health Concerns

The primary public health concerns include but are not limited to: public health advisories; agent identification; hazard identification; hazard reduction; environmental decontamination; clinical medical support; pharmacy support; worker safety; and mortuary support. In the event of a chemical attack with a highly lethal agent, immediate therapy is essential. It is important to emphasize that the attack in Japan was not with a highly lethal concentration of sarin and that only those in the immediate vicinity of the release were killed. Thus the threat to health and safety of both the first responders and many of the victims was relatively low. However, even in the case of relatively small number of people killed, as in the case of the cyanide tampering of Tylenol in the U.S., there was public panic that demanded prompt response. First responders have informed us that proper equipment and training is essential to ensure a prompt response and that currently, some metropolitan areas are unprepared. These courageous fire fighters, police, and emergency medical support personnel risk their lives to protect us. It is just wrong to ask them to respond without proper preparation.

With a biologic agent, there is an incubation period followed by a sudden onset of symptoms. The rapid identification of the agent is necessary to save lives through antimicrobial therapy as the organism can spread to individuals outside the original site of attack. Since public anxiety can be expected, accurate public health advisories, an appropriate supply of medicine and the capacity to respond medically are among the most essential activities.

At this time, there is no coordinated public health infrastructure to deal with the medical consequences of terrorism. The budget request would provide the resources to begin to address the following deficiencies:

- Lack of integration at the Federal, State and local levels, of various disciplines required to respond to this type of threat;
- Inadequate number of trained and experienced responders at all levels;
- Medical response not placed in high risk metropolitan areas, such as Washington, D.C.;
- Inadequate infrastructure to respond to the increasing number of emergencies, including an insufficient secure communications facility; and
- Significant gaps in early warning and detection systems, identification of chemical and biologic agents, surveillance, decontamination procedures, and worker safety—both in high risk areas and in Federal facilities. If funds are not appropriated to fulfill the President's request, the Federal/State/local coordinated response would be compromised.

HHS Plan of Action

The threat of terrorism with weapons of mass destruction is real. While the first line of defense is good intelligence and effective crisis management, the Nation must be prepared for the unthinkable health and medical consequences. Since it is likely that both local and State resources would be overwhelmed in the aftermath of a terrorist attack with weapons of mass destruction, an integrated Federal, State and local response is required. Key ingredients of the plan include, but are not limited to the following:

- Coordinated planning of the integrated Federal family of health and medical responders with State and local first responders. It is not acceptable to exchange business cards for the first time at the site of a disaster.
- Identification and development of training and exercise materials.

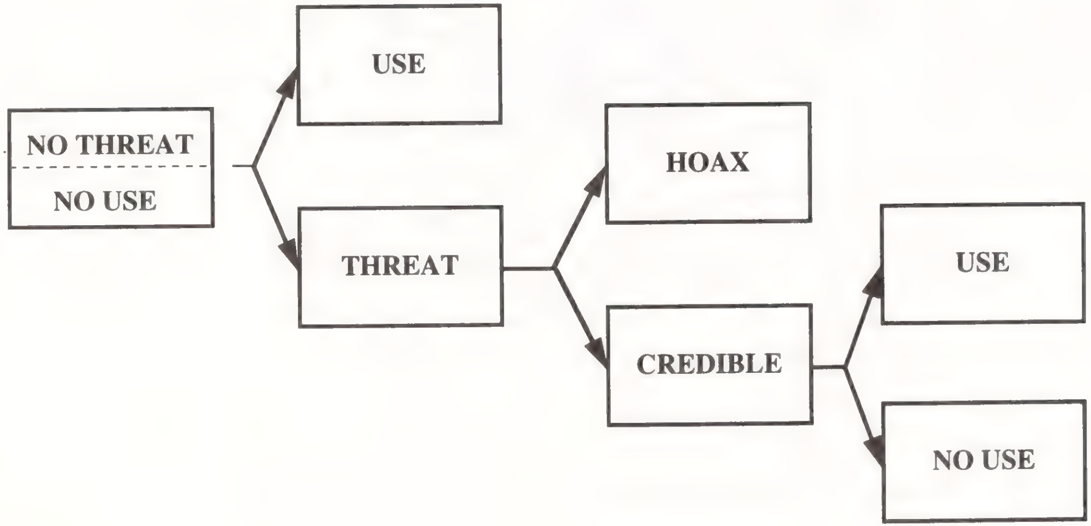
- Formation of integrated teams of first responders with emphasis on pre hospital care including: triage of patients, decontamination of patients, treatment of patients, and as appropriate, patient evacuation.
- Pre-development of public health advisories and repositories of information that are readily available during crises.
- Augmentation of the infrastructure at the Centers for Disease Control and Prevention, the Food and Drug Administration and the National Institutes of Health to rapidly identify chemical and biologic agents.
- Augmentation of the Federal first responder capability to ensure technical assistance and rapid deployment of NDMS.
- Ensure sufficient supplies of medicines and vaccines to meet potential needs.

This is an important and large mission. To do less would be a disservice to the American people.

Mr. Chairman, this concludes my opening remarks. I would be happy to answer any questions that you and the Subcommittee members may have.

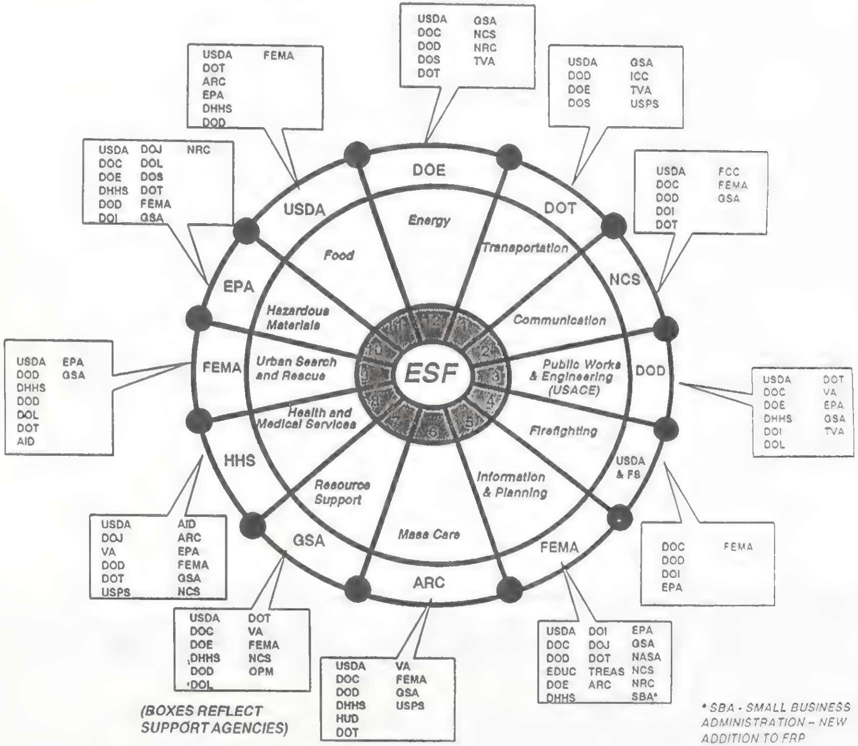
Chart 1

C / B TERRORISM THREAT STAGES



FEDERAL RESPONSE PLAN - Emergency Support Functions

Chart 2


ESF
1 Transportation DOT
USDA DOD DOE DOS GSA ICC TVA USPS
2 Communication NCS
USDA DOC DOD DOI DOT FCC FEMA GSA
3 Public Works & Engineering (USACE) DOD
USDA DOC DOE DHHS DOI DOL DOT VA EPA GSA TVA
4 Firefighting USDA & FS
DOC DOD DOI EPA FEMA
5 Information & Planning FEMA
USDA DOC DOD EDUC DOE DHHS DOI DOJ DOT TREAS ARC EPA GSA NASA NCS NRC SBA*
6 Mass Care ARC
USDA DOC DOD DHHS HUD DOT VA FEMA GSA USPS
7 Resource Support GSA
USDA DOC DOE DHHS DOD DOL DOT VA FEMA NCS OPM
8 Health and Medical Services HHS
USDA DOJ VA DOD DOT USPS AID ARC EPA FEMA GSA NCS
9 Urban Search and Rescue FEMA
USDA DOD DHHS DOD DOL DOT AID EPA GSA
10 Hazardous Materials EPA
USDA DOC DOE DHHS DOD DOI DOJ DOL DOS DOT FEMA GSA NRC
11 Food USDA
USDA DOT ARC EPA DHHS DOD FEMA
12 Energy DOE
USDA DOC DOD DOS DOT GSA NCS NRC TVA

(BOXES REFLECT SUPPORT AGENCIES)

* SBA - SMALL BUSINESS ADMINISTRATION – NEW ADDITION TO FRP

Chart 3

ESF #8 LEAD RESPONSIBILITIES

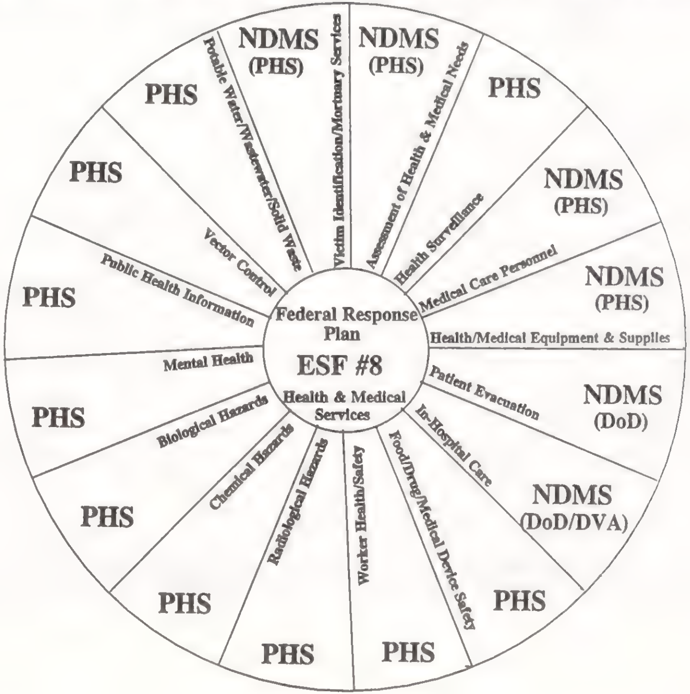


Chart 4

NATIONAL DISASTER MEDICAL SYSTEM DEPLOYMENT

STATE	# OF MEMBERS	HUGO	ANDREW	INIKI	EMILY	MIDWEST FLOOD	CA QUAKE	SOUTHEAST FLOOD	OKLAHOMA CITY	MARILYN	OPAL	TOTAL
Alaska	0											0
Alabama	117											0
Arkansas	90									1	1	2
Arizona	31											0
California (9 teams)	835			1			5			1		7
Colorado	23											0
Florida (4 teams)	611		2							1	4	7
Georgia (3 teams)	280		1					1		1		3
Hawaii	169		1				1			1		3
Illinois	34											0
Indiana (4 teams)	333		1							1		2
Kentucky	91		1	1						1		3
Massachusetts (2 teams)	271		4							1		5
Maryland (5 teams, including PHS 1 & 2)	311	1					2	1	1	2		7
Michigan	130						1					1
Missouri	54					1						1
Mississippi	19											0
North Carolina	145		1		1					1		3
New Jersey	64											0
New Mexico	286	1	2	2			1				1	7

Chart 5

NATIONAL DISASTER MEDICAL SYSTEM DEPLOYMENT

STATE	# OF MEMBERS	HUGO	ANDREW	INIKI	EMILY	MIDWEST FLOOD	CA QUAKE	SOUTHEAST FLOOD	OKLAHOMA CITY	MARILYN	OPAL	TOTAL
New York (3 teams)	137					1		1	1			3
Ohio (3 teams)	225		1							1		2
Oklahoma	125		2				1		1	1		5
Oregon (2 teams)	35											0
Pennsylvania (2 teams)	54											0
Rhode Island	124											0
South Carolina	20											0
Tennessee (2 teams)	88											0
Texas (2 teams)	217		1				1		1		1	4
Vermont	22											0
Washington	100			1			1					2
Wisconsin	43											0
TOTAL	5,084	2	17	5	1	2	13	2	4	13	7	67

Chart 6

Significant Emergency Responses Involving the U.S. Public Health Service (1989-Present)

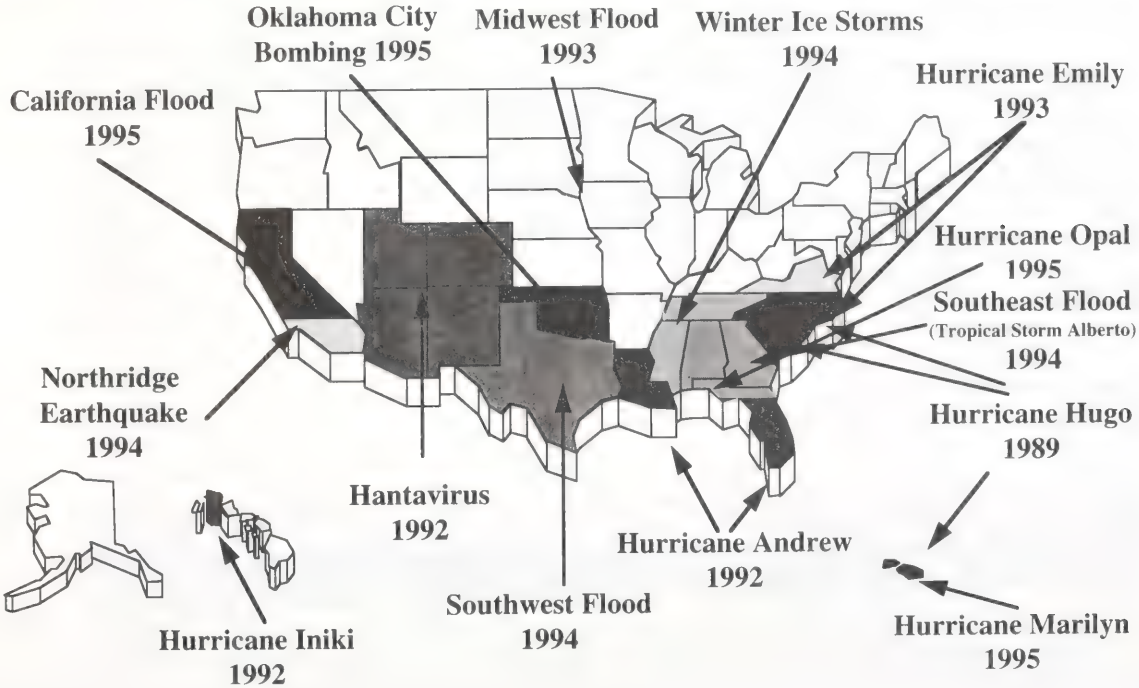


Chart 7

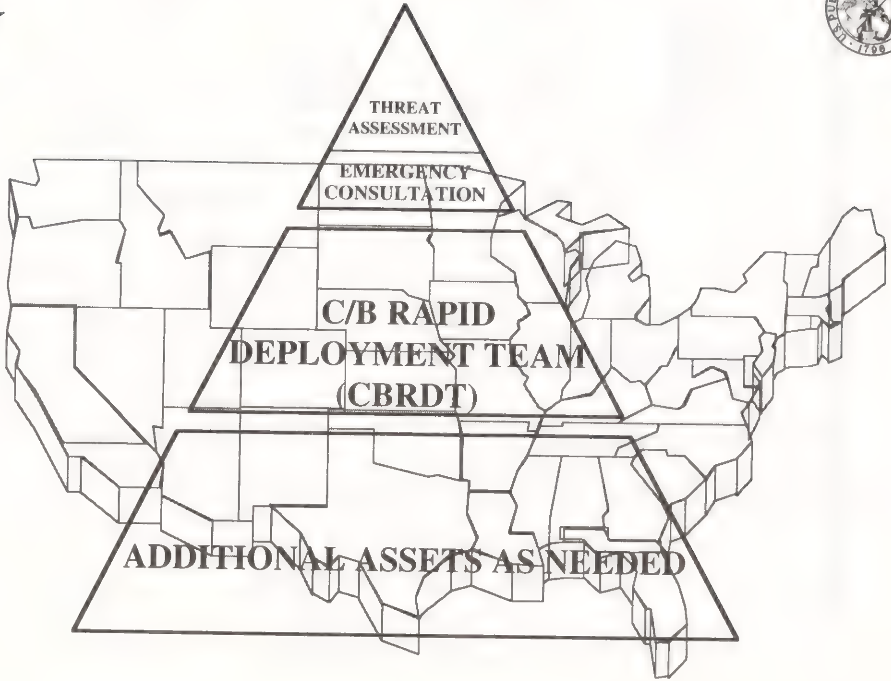
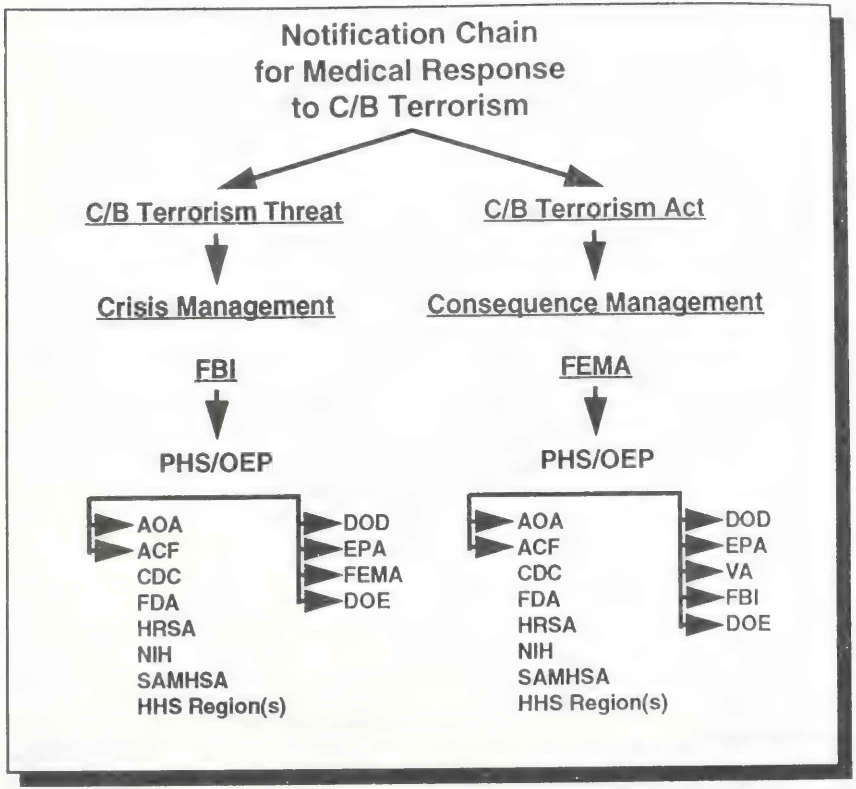

THREAT
ASSESSMENT
EMERGENCY
CONSULTATION
C/B RAPID
DEPLOYMENT TEAM
(CBRDT)
ADDITIONAL ASSETS AS NEEDED

Chart 8



Notification Chain for Medical Response to C/B Terrorism

Chart 9

COMPOSITION OF C/B RAPID DEPLOYMENT TEAM

- Public Health Service (PHS) - (5)
  - 2 MDs
  - 3 Operations Technicians
- U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) - (2)
  - 1 MD (Epidemiological Assesment/Biowarfare Expert
  - 1 Scientist (Medical Diagnostics/Medical Samples)
- U.S. Army Medical Research Institute for Chemical Defense (USAMRICD) - (2)
  - 1 MD
  - 1 Scientist (Chemical Warfare Expert)

Chart 10

- U.S. Army Technical Escort Unit (TEU) - (8)
    - 8 Hazardous Environment/Explosive Disposal Operators
- Naval Research Institute (NMRI) - (2)
    - 2 Biological Identification Specialists
- Edgewood Research, Development, and Engineering Center (ERDEC) - (2)
    - 1 Chemical Scientist (C/B Antiterrorist Team)
    - 1 Technician (Remote Meteriological Sensing, Data Bases, Hazard Prediction)
- Environmental Protection Agency (EPA) - (1)
    - 1 Environmental Monitoring Specialist
- Department of Energy (DOE) - (1)
    - 1 Radiological Monitoring Specialist

METRO STRIKE TEAM WORKING GROUP RECOMMENDATION

PREFACE:

Consistent with the need to ensure effective and appropriate consequence management for chemical and biological release-related events; and cognizant that the ramification of such events are overwhelmingly medical in nature; and recognizing that present civilian pre-hospital EMS and in-hospital capabilities lack the proper resources and training to confront what was previously viewed as a military problem; this development team proposes that the following strategy for resolving this potential public health emergency while ensuring the highest level of patient care consistent with existing professional standards of operations be adopted.

Chart 12

METRO STRIKE TEAM PURPOSE/MISSION STATEMENT

- *MST responds at request of local and/or regional jurisdictions.*
- *Responds to and assists with medical management and public health consequences of chemical and biological incidents.*
- *MSTs positioned at major metropolitan areas.*
- *Used at local and regional levels.*
- *Available for national deployment.*

Chart 13

METRO STRIKE TEAM SCOPE OF OPERATIONS

- *Medical management of chemical and biological (C/B) incidents arising from consequences of technological accidents and/or terrorism.*
- *Technical consultation of C/B incidents.*
- *Medical intelligence about the C/B incident.*
- *Interaction with applicable law enforcement and other C/B terrorism response agencies.*

Chart 14

READINESS LEVEL-I DMATs

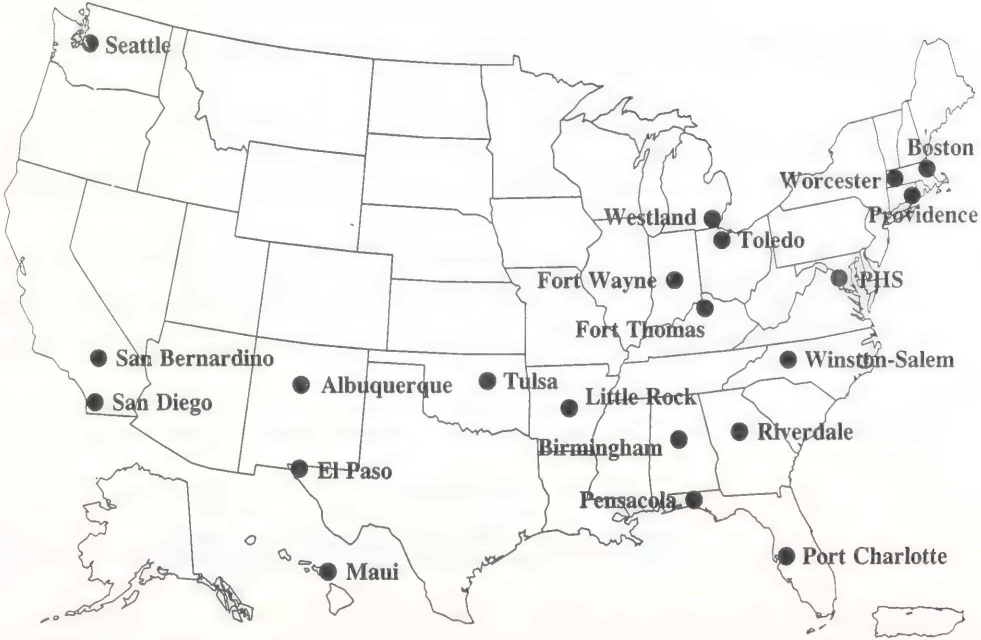


Chart 15

CRITICAL C/B CONSEQUENCE MANAGEMENT FUNCTIONS

- Threat Assessment
- C/B Consultation with Affected Jurisdictions
- Public Affairs
- C/B Rapid Deployment Team (CBRDT)
- Agent Identification
- Epidemiological Investigation
- Expedient Hazard Detection
- Expedient Hazard Reduction
- Environmental Decontamination
- Mental Health Support

Chart 16

CRITICAL C/B CONSEQUENCE MANAGEMENT FUNCTIONS (Continued)

- Clinical Medical Support
  - Health Professionals
  - Laboratory Support
  - Patient Evacuation
  - In-hospital Care
- Pharmaceutical Support
- Human Toxic Effects Registry
- Supplies and Equipment
- Victim Identification and Mortuary Services

Senator NUNN. Thank you, Dr. Young.

I am going to defer to Senator Cohen to ask Mr. Holmes questions at this point and then we will come back with questions for the panel.

Senator COHEN. Just a couple of quick questions, Senator Nunn.

On page 3, Mr. Holmes, you indicate that it a DoD policy directive requires you to inform other personnel through "prompt dissemination of intelligence information on terrorist threats." As I read that, it looks like dissemination of information to DoD personnel. Does it go beyond that? As I understand it, in the wake of the attack in March, DIA was among the first to gather information about Aum's activities and I am wondering what kind of circulation you provided to other intelligence agencies beyond DIA. How does it get beyond DoD?

Mr. HOLMES. That information is piped almost immediately into the intelligence community network and it is available to everybody. In fact, we met literally within hours after the news of the Aum Shinrikyo attack. Our NSC group met together, and John O'Neill was there——

Senator COHEN. So, basically, the dissemination goes beyond simply DoD?

Mr. HOLMES. Yes.

Senator COHEN. It goes through the intelligence community?

Mr. HOLMES. Information goes throughout the intelligence community.

Senator COHEN. Second, on page four of your testimony, you indicate that "DoD counterterrorism response capabilities are routinely exercised from the tactical to the national level" and you "frequently train and exercise with foreign CT units." One of the consequences of *posse comitatus* is exactly that the DoD should have an assisting role but not the primary role within the U.S. You have joint activities with other Federal agencies, but there is no mention made about State and local agencies. Have you had joint activities at the local level?

Mr. HOLMES. Yes, we have. I cannot think of any particular exercises at this point, but when we do conduct these joint exercises in communities, the local law enforcement authorities are involved, at a minimum, in allowing us to set up the maneuver area.

Senator COHEN. I think we need to have perhaps some more detailed briefing in terms of what type of activities that the Department plans in its exercises with local law enforcement and State agencies, as well.

Mr. HOLMES. I would be glad to respond to that.

Senator NUNN. Let me also yield to Senator Glenn for questions to Mr. Holmes.

Senator GLENN. Thank you, Mr. Chairman.

I just was wondering, I do not believe I heard you mention, and this would come under the control of DoD, what NSA does in this. NSA has some absolutely mind-boggling capabilities as far as picking up information and preventing some of these things from ever happening. I know they feed information that goes out to the CIA and so on; it is all a cooperative effort. There have been budget cuts out there and so on that I just find are unconscionable almost with the job that they could be doing.

Are they tasked to look into this particular area? If not, why not? Are budget cuts affecting their ability to do this? Did you leave them out of your testimony inadvertently as an important player, or——

Mr. HOLMES. No, NSA is a critical player, obviously, and their intelligence gathering and warning capabilities are definitely cranked into what we do as a community. That exists and it is continuing.

Senator GLENN. Are the budget cuts they are facing cutting back on their ability to do some of these jobs?

Mr. HOLMES. I could not give you an informed answer to that, Senator, but I would be glad to take the question and submit it in writing.

Senator GLENN. If you could provide that for us, I think——

Mr. HOLMES. Yes.

Senator GLENN. I think some of the cutbacks in those areas are very—we think the Cold War is over so all of our problems have been solved, and we have just changed directions in some of our problem areas is all we have done. Thank you.

Senator NUNN. Mr. Holmes, let me ask one or two and then we will get you out here in a couple of minutes. Have there been changes in the way the Department of Defense conducts its business since the Aum Shinrikyo attack?

Mr. HOLMES. I hope I would not surprise you by saying that a lot of what we have been talking about today, we have been working on for about a year and a half, particularly regarding weapons of mass destruction and with a special focus on chemical and biological threat, dating to about 6 months before Aum Shinrikyo.

That attack, however, did confirm that we were on the right track and stimulated us to redouble our efforts in certain areas, for example, to focus more of our research and development for counterterrorism technologies on the threat. There is a new Marine Corps response unit that is being organized by the Department of the Navy, that will be operational probably this coming summer, and will be available to operate in a contaminated environment. The unit would participate in the consequence management area of an attack. It will be an asset available to DoD as a whole and to the interagency.

These are two specific examples of where we have focused our effort more intensively since Aum Shinrikyo.

Senator NUNN. The antiterrorism bill as passed the Senate and is pending in the House, and I understand that there is considerable reluctance to pass it over there; there are a lot of different features of it. What features of that bill are essential, if any, for the Department of Defense in addressing your role to biological response as well as chemical response for an attack in the United States?

Mr. HOLMES. I would like to give you a more considered answer in writing on that, but certainly to the extent that we are able to operate and support civilian law enforcement in taking care of a chemical and biological incident, that will be helpful.

But even today, we feel that we do have the authority to provide expert support to law enforcement. The only thing that is missing today would be the authority to lift posse comitatus limitations which do prevent active military from arrests, searches, seizures, those kinds of law enforcement activities.

Senator NUNN. In a chemical environment, if a subway were attacked in the United States, in the middle of a big city in the United States, and the environment were such that DoD personnel were the only ones equipped to go in, would you need additional authority in the law from what you have now to be able to go in and make arrests?

Mr. HOLMES. To make arrests, yes we would.

Senator NUNN. You could go in now and help law enforcement——

Mr. HOLMES. We could go in and help with the incident, but——

Senator NUNN. But you could not make arrests?

Mr. HOLMES. We could not make arrests, no. However, the President always has emergency authorities, special authorities. He could declare an emergency and then authorize the use of DoD forces, but there is no automatic ability today to do that.

Senator COHEN. Could you use lethal force, not make arrests, but could you kill?

Mr. HOLMES. We could, obviously in the protection of the units, that individual protection, that is always a possibility, yes.

Senator NUNN. Let me ask all of you before you leave the question, and I will invite anyone who would like to respond. Did you know about the Aum Shinrikyo group before the March 1995 attack? This group had carried out an attack in Japan, in Matsumoto City, in June of 1994. Had that appeared on the scope of any of our intelligence law enforcement agencies before the March 1995 attack?

Let me start with Dr. Oehler. Did the CIA know about this group before March of 1995?

Mr. OEHLER. No, we did not. We were not following them prior to that attack.

Senator NUNN. Ms. Fenchel?

Ms. FENCHEL. Senator, as I said in my testimony, we received information from the company in Connecticut that an Aum publishing company was attempting to procure and export a laser. We did conduct that investigation. They did not procure it. They did not export it. We entered it into our data base. We put a permanent record in there and we did share that information with other law enforcement and with the intelligence community.

Senator NUNN. Mr. O'Neill, did the FBI know about the attack before March of 1995?

Mr. O'NEILL. No, Senator.

Senator NUNN. Mr. Holmes, DoD?

Mr. HOLMES. No.

Senator NUNN. Dr. Young?

Dr. YOUNG. No.

Senator NUNN. The question is, should you have known? When an attack takes place in an allied country, like the Matsumoto City attack in June of 1994, should our intelligence or law enforcement agencies have known about that and been more closely attuned to the activities of this group, particularly since we see what they have done in Australia, we see what they have done in advertising in Russia on the radio station, TV station, 30,000-some-odd members in Russia, 10,000 or 15,000 in Japan, operations in New York City, Germany, and so forth.

Is this something that should have happened before the March 1995 attack? Dr. Oehler?

Mr. OEHLER. The earlier attack in Matsumoto did draw a lot of attention in the intelligence community because it was alleged that sarin was used. However, the reporting that came out from that had some significant ambiguities. For example, it talked about the leaves turning yellow and brown, not a characteristic of sarin. They also talked about the sickness coming from foul water in a fish pond. Sarin hydrolizes, and so that could not have happened that way.

At the same time, the Japanese felt they had closed the case with an arrest of an individual who, by the way, was not released until after the Tokyo attack.

So the information was ambiguous. The cult was not identified until after the 1995 attack, and as far as we understood, the Japanese believed they had the case closed.

Senator NUNN. I know that Mr. Holmes has to leave. Do you want to answer anything on this question?

Mr. HOLMES. I would just point out that no, we did not know about it. We are learning about the forms that terrorism takes all the time and this is an object lesson for us. I think we have to scan more carefully these kinds of groups when they appear before us.

In the past, unless we had specific information of a threat from a cult against a U.S. military installation or forces abroad, there are many cults out there and we do not normally scan them all. But as I say, we are learning more and more about this phenomenon and I think we have to do better.

Senator NUNN. Mr. O'Neill, the FBI did not know. Should you have known?

Mr. Holmes, we will excuse you if you need to leave. We promised you 12:40. It depends on your time.

Mr. HOLMES. Thank you very much, Senator.

Senator NUNN. Thank you.

Mr. O'NEILL. Senator, as you know, we have a small office of a couple of FBI agents assigned to the embassy in Tokyo. Their primary function is to act as liaison with their law enforcement colleagues in Japan and to work on cases which may generate out of the United States which would produce leads in Japan or leads from the Japanese law enforcement authorities that would have impacted us here in the United States. We received no information from the Japanese National Police or any other law enforcement agency in Japan through our office in Tokyo prior to this event.

Senator NUNN. Should you have? Is this a breakdown in U.S.-Japanese communication, between our law enforcement agencies? Looking back on it, knowing what at this stage we know and knowing what the Japanese knew, should they have alerted you or should you have been more inquiring yourself? After all, we have tens of thousands of military personnel stationed in Japan, thousands of American citizens, a very close ally in almost every strategic sense.

Is this a breakdown? Is it something we really need to improve with both Japan and other allies?

Mr. O'NEILL. I would say from the FBI's perspective, which is the only one that I can answer, is that the role for our personnel there is a law enforcement role. It is not an intelligence function. That is assigned to other agencies within the intelligence community. Absent any indication of a U.S. role or involvement or having an affect on the U.S., I do not know that given that it was a religious group or cult that we would necessarily go out and try to collect intelligence information about a religious group.

I would say that the information and our relationships with the Japanese after this incident was one of constant dialogue, of us continuing to ask for additional information. Although we did not receive all of the information as timely as we may have liked it, we certainly respect the Japanese form of justice and their laws and their regulations.

Senator NUNN. I guess the bottom line is, are you working to improve your communication with the Japanese in light of what we know now, particularly considering the worldwide scope and considering this was an operation trying to secure high-technology instruments in the United States, considering the tremendous recruitment effort that was more or less public knowledge in Russia, considering the Australian purchase of land, uranium mining, the testing of sarin gas, the German contacts, the huge number of telephone calls and so forth made back and forth from New York to this cult.

Given all of that, looking back on it, would you say we have some real challenges for improvement here?

Mr. O'NEILL. I think that you have a challenge in any group or individuals that have religious affiliations where you do not have a pre-knowledge on U.S. law enforcement, our abilities to have a pre-knowledge that they are engaged in a political or social agenda through the use of violence or the threat of violence. Once that became apparent, I think that our discussions and dialogue with our Japanese colleagues was robust. It was very, very extensive and it remains that way today, both in terms of exchange of personnel coming to the United States to carry on meetings with us here and our sending personnel on a regular basis to Japan, experts in the area of chemistry and behavioral science.

Senator NUNN. So you do not see anything the FBI omitted to do that you should have done, even looking back on it?

Mr. O'NEILL. I do not think that it was our role to collect intelligence information about groups within Japan. That was not our role, and at that time there was no indication for us that they were engaged in any criminal activity within the United States

Senator NUNN. Dr. Oehler, what about the CIA? Looking back on it, knowing what we know now, what would you do differently?

Mr. OEHLER. Let me say, too, that the Aum was a registered religious group in Japan. A lot of the information you have now about the size of the budgets that they had and so forth came out since the attack. Being a registered group in Japan, it had a lot of protection from even the Japanese investigative services. And while there were some complaints about the group and preliminary investigations—in fact, the Japanese police found no evidence of criminal activity, criminal intent, and therefore did not follow it any further.

I would like to agree with Mr. O'Neill that, at least for us—I might point out that I really do not see any inclination here or abroad to have the CIA running around peering into religious groups around the world to see who is naughty and nice.

Senator NUNN. Even those that are preaching Armageddon between the United States and Japan, predicting war, assassinating people, recruiting thousands of members in Russia, advertising on Russian radio and television, penetrating high-level Russian research facilities as well as Japanese police organizations? I understand what you are saying about religion, but it just seems to me the massive scope of this operation should have come to the attention of somebody in the CIA or the FBI in Japan, Russia or in America.

Mr. OEHLER. Asahara's writing certainly did have a decided anti-Americanism slant to them, but I think it is really important to know that the real threat of this group was to the Japanese, the Japanese politicians and the Japanese population. The anti-Americanism was really the external threat that they generated to justify the internal actions that they were about to take.

For example, they accused the U.S. of spraying sarin on their compounds in Japan and that was then used as a guise for when they were going to spray sarin on Japanese cities.

Senator NUNN. But that did not come to our attention. That was all after the March——

Mr. OEHLER. That is right. This is all after the fact. As I said earlier——

Senator NUNN. Should that have come to our attention? That someone was accusing the United States of spraying chemical gas on a religion in Japan? I mean, I am not saying you should have known it, but should the Japanese have told you about it?

Mr. OEHLER. These are always very difficult. The world is full of very crazy organizations that have designs against the U.S. The U.S. is a very large figure, country in the world. Anyone who is dissatisfied with the status quo usually picks up the banner against the United States.

You are certainly welcome to argue that, quite frankly, we have not followed religious cults around the world and we do not have right now the resources to be able to do that. I think the important point is that the first line of defense in any of these is the local in-country police force, and if there is some indication that there is some problem that goes beyond that, then it is, of course, a very critical role for the intelligence community outside the U.S., from the FBI and others inside the U.S., to recognize that and take whatever action is necessary.

Senator NUNN. I will ask a question of Dr. Young, and then I will rotate to Senator Cohen. Do you want to tell us what the result would be in terms of your abilities or what your role and mission if the House Budget cuts to your agency go through?

Dr. YOUNG. You are correct, Senator, in the sense that our office is the office that coordinates not only all of the emergency activities for the Department of Health and Human Services, and the health and medical emergency responses of the Federal Response Plan, but also is responsible for the emergency support function in the national disaster medical system. The President requested $2.4

million for our budget, the Senate recommended $2 million and the House recommended zero.

I am afraid it is sort of like an insurance policy. I guess people are not interested in paying for insurance. Yet, each of us wants prompt attention when disaster strikes. We have been actively mobilized throughout the past 3 years, responding to Hurricane Andrew, Hurricane Iniki, the Midwest, Southeast and Southwest floods, and the California earthquake. Just recently, I spent 5 weeks in the Virgin Islands in response to Hurricane Marilyn.

In the absence of funding, it would be extraordinarily difficult to maintain this coordinated activity. There have been substantial decreases within the Department of Health and Human Services as there was the merger of the Office of the Assistant Secretary of Health with the Office of the Secretary, and I guess we would become a non-funded mandate.

Senator NUNN. What would happen in terms of our ability to respond to a biological or chemical attack if your agency were eliminated? Who would pick up the ball?

Dr. YOUNG. The only way that it could be picked up would be to develop another office just like ours. Our office integrates the response of the entire Department of Health and Human Services and also coordinates the actions of the Department of Defense, the Department of Veterans Affairs and private sector health providers through the National Disaster Medical System. We also need to interrelate very closely with the groups that Mr. Holmes described.

So I guess if we went out of existence, another Office of Emergency Preparedness would have to be invented and somehow funded.

Senator NUNN. You, in effect, you are a contractor for FEMA, right? The Federal Emergency Management Agency has your office doing——

Dr. YOUNG. Kevin, if you could display the Federal Response Plan chart again. The Federal Emergency Management Agency coordinates and manages the various functions. There are 12 primary functions. For example, the Department of Transportation at 1 o'clock coordinates transportation for FEMA and serves as the lead Department on all of those actions related to transportation.

HHS, through our office, coordinates the entire Federal health response. Thus, we coordinate and bring together the appropriate DoD assets, the appropriate VA assets, and the appropriate transportation assets. This is done in our office. Our office carries out the leadership responsibility of the Department of Health and Human Services for the function.

Senator NUNN. But you are it for HHS?

Dr. YOUNG. We are it for HHS, and I am the doctor that makes house calls on the Nation.

Senator NUNN. Was there a rationale given for the House cut?

Dr. YOUNG. The only rationale that I could see in the record was that the House recommended that funds could be provided from somewhere else within the Department's management budget.

Senator NUNN. Senator Cohen?

Senator COHEN. Thank you, Mr. Chairman.

One of the purposes of holding these 2 days of hearings was to alert the public to the nature of the threat that this country and others face. I discovered in talking to one news correspondent that some executives in New York did not think that the hearings were stimulating enough for coverage yesterday and I was going to suggest one way for Senator Nunn to draw attention to this problem was to wear that gas mask that Ms. Fenchel has brought in here today. Then I said, well, I had better not do that. I remember the days of Michael Dukakis putting the helmet on in the M1A1 tank.

Senator NUNN. It did not play well. [Laughter.]

Senator COHEN. That is not exactly the image you want to project here, but that might get some attention about the kinds of protective gear that may be necessary for individual citizens to have stockpiled in their basements sometime in the future.

I want to say something about the intelligence community in addition to what I said this morning. The Ames case was an unmitigated disaster. There is absolutely no way that any of us can soft-peddle what was done and what was lost, both in lives and information. I think it ranks right up there with the Walker case. It is every bit as damaging, if not more damaging, than we had in the Walker case back in the early 1980s, and so real changes have to be made.

They are being made. Personnel changes are being made. Policy changes are being made. Procedure changes are being made. Every time something like this happens, someone will say, well, let us just dismantle the agency. Let us put all the responsibility somewhere else. Dr. Young, we will take your responsibility and put it somewhere else. How about State? How about NSA? How about DoD?

So I think my response is, how about Felix Bloch for the State Department? How about NSA and Ronald Pelton? How about the Navy with Walker and Whitworth and Pollard? How about the Army with James Hall and Mr. Conrad? So the notion that somehow that we can put this responsibility in some other agency and have assurance that it is going to be secure. I think is belied by the facts.

There are a lot of changes that have to be made in order to reassure policy makers that we are getting good intelligence, untainted intelligence, and I think those changes are underway. So do not take my statement this morning simply as an endorsement of what is going on. There are a lot of intelligence failures. This may be one here in the Aum case that we are talking about.

Dr. Oehler, does the CIA have a copy of the notebook that was kept by the Aum construction minister, Hayakawa?

Mr. OEHLER. I believe the correct answer is no. I do not, for sure.

Senator COHEN. Have you tried to obtain it?

Mr. OEHLER. I have only heard that such a notebook exists at this point.

Senator COHEN. Mr. O'Neill, do you have a copy of that notebook?

Mr. O'NEILL. I do not believe we do. I will double-check, though.

Senator COHEN. What does that say about the sharing of information? We had testimony yesterday about such a notebook. The CIA does not have a copy of it. The FBI does not have a copy of it. There were indications, notations. They may have been simply musings. They may have been plans. But did the Japanese authorities, did the Australians, did anyone make that notebook available to anybody in the U.S. Government? Do you know?

Mr. OEHLER. As I stated, I have heard stories that such a notebook exists. These are unofficial stories. To the best of my knowledge, the Central Intelligence Agency and the Intelligence Community do not have a copy of any such notebook.

Senator COHEN. That speaks a lot about the sharing of intelligence information amongst the agencies charged with sharing such information about potential terrorist attacks.

Mr. OEHLER. Are you speaking within the U.S. Government?

Senator COHEN. I am talking about within the U.S. Government. You said something earlier which caught my attention. You said the CIA is not in the business of collecting information on religious groups in other countries. Not even when there is word as early as last January that there was a prediction by this particular cult that there would be an assassination of President Clinton? Do you think that that is serious enough to start collecting information when that starts to percolate up in the Japanese press?

Mr. OEHLER. If that were the case, it certainly would be and the Secret Service would be working on it, as well. However, I have not seen any direct reference to the threat to the President of the United States. There is an inference and the inference is that originally, Asahara had talked about 1997 as the time of armageddon, when there would be a war between Japan and the United States.

Senator COHEN. Were there not reports in January of this year that he was also predicting the assassination of President Clinton?

Mr. OEHLER. Not to my knowledge, and I have looked hard for that.

Senator COHEN. I know that is the——

Mr. OEHLER. Let me explain what I did see so that there is not any confusion here. What we did see was Asahara moved the time frame up of the armageddon from 1997 to November of 1995. People then looked around and said, what is going on in November of 1995, and the obvious thing that sticks out is the APEC summit. So there is an inference. But in all of my looks and in all of my discussions with intelligence community people, including in the counterterrorism center, I have not seen a direct reference to a threat.

Senator COHEN. But there is an Aum publication dated January 25, 1995, that states, “Clinton will be, without doubt, a one-term President. At best, he will not be reelected. At worst, it would not be strange if he were assassinated, making it appear like an accident.” Now, is that something that ought to catch the attention of our intelligence officials——

Mr. OEHLER. I am aware of that——

Senator COHEN [continuing]. Be it the FBI or the CIA or someone?

Mr. OEHLER. Certainly, in hindsight, you can argue that. But at the time, this is the kind of thing we see routinely around the world. I might add that during this same time, there were real threats, real terrorist threats to the U.S. that the intelligence community was working on and, in fact, had some success on.

Senator COHEN. This is not routine. This is not one of these routine sightings here. We already had the attack at Matsumoto at this point. The Japanese press was carrying stories on a regular basis on the threat this particular cult group posed. This is not some isolated group, one amongst thousands of groups who have these threats. I know about the threats made against the President and other officials.[1]

But it would seem to me if you have an incident such as Matsumoto, which I have not even begun to talk about yet, the Aum would merit attention. Kyle Olson, who testified here yesterday, issued a report in January about this June 1994 attack and I think he provided pretty persuasive evidence that a terrorist attack that had used sarin had occurred and that it was probably a test run for a larger attack, and he was sort of dismissed. No one gave it too much credibility.

He had this report distributed in January to the CIA, the National Security Council staff, ACDA, the Office of the Secretary of Defense, and from what I can detect, that report was ignored.

Mr. OEHLER. Let me say again that the Japanese association, as I understand it, the Japanese association of the Aum Shinrikyo with sarin did not occur until after the Tokyo attack, that yes, there was the Matsumoto attack, and indeed we now know that that did involve Aum Shinrikyo. The Japanese, as I understand it, felt that they had a suspect, had arrested a suspect for that and he was in jail at that time and the case was closed.

Senator COHEN. My understanding is your agency is about to be under severe threat of elimination. Do you know whether or not the U.S. embassy in Moscow had done any research on Aum's activities in Russia?

Mr. OEHLER. I have not seen any. I would again like to say that Aum Shinrikyo did not really—we did not focus attention on that prior to——

Senator COHEN. Once again, we have had a lot of testimony here in the last day or so about the activities of the Aum cult making numerous trips to Russia, recruiting several thousand followers. It seemed to me that that was something that should be of concern in terms of that cult's activities in Russia. My further understanding is that there has been no collection on this and there was no attention paid to this by our embassy in Moscow until the staff of this Committee went over in September to raise the issue.

Mr. OEHLER. I think you will find that there was some interest on the part of the embassy there after the gas attack in Tokyo. In fact, publications out of Moscow show this. But it is true that we did not recognize or pay much attention to Aum Shinrikyo in Russia.

I would like to say that since religious freedoms came about with the fall of the Soviet government, that is a fertile ground for religious cults. There are a lot of religious groups and cults. I should not call them all cults. There are a lot of religious groups that are working very hard to recruit members in Russia. So the fact that Aum Shinrikyo was there did not attract attention.

The fact that it had some high-level attention from some government officials there, Asahara was dripping a lot of money and that attracts a lot of attention these days in Russia.

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[1] See Exhibit No. 41.

Senator COHEN. Mr. Chairman, the Aum threat has not ended with the Tokyo subway attack in March. Later that month, the head of Japan's National Police Agency was shot and wounded, for which an Aum member was arrested. In April, all of Japan was put on alert because of concerns about a rumored Aum prophesy that disaster would occur.

In May, Aum conducted another chemical weapon attack in the Tokyo subway system using a hydrogen cyanide-producing device that could have killed anywhere from 10,000 to 20,000, but subway workers fortuitously discovered the device shortly before it produced the poison gas.

Later, again in May, another assassination attempt was made on the governor of Tokyo, wounding an aide. In July, hydrogen cyanide devices that failed to work were discovered in four Tokyo subway stations.

In late September, just a few weeks ago, the Japanese police discovered a large cache of chemical weapons precursor in what is believed to have been a hiding place for a member of the Aum intelligence unit. The nineteen pounds of sodium cyanide could have been used to kill as many as 70,000. Japanese officials believe that Aum members are in possession of an unknown quantity of VX, which is a pretty potent nerve agent that the Aum earlier this year used in at least two attacks on individuals.

So even though the Tokyo incident may be over, the threat that is posed is not over, and so I think that we have to direct a good deal more attention to this matter.

One final point and I am going to stop, Mr. Chairman.

Ms. Fenchel, you talked about this individual who tried to export how many pounds of nerve agent? How much was it?

Ms. FENCHEL. Two-hundred-and-fifty tons.

Senator COHEN. Two-hundred-and-fifty tons, and the maximum sentence he received for conspiring to export nerve gas was 30 months?

Ms. FENCHEL. Yes, that is correct.

Senator COHEN. Is that within the guidelines? Is that shocking to the Customs Agency? What were the mitigating factors involved in someone trying to sell 250 tons?

Ms. FENCHEL. The fact that it was a conspiracy charge, that it was a sting operation. He did not export or actually attempt to export because we were the providers of the 250 tons. The court felt that that was an appropriate sentence for that charge. And no, we are not happy with it.

Senator COHEN. Are there other cases in which you feel that perhaps the Federal guidelines in dealing with chemical and biological weapons or precursor materials need to be looked at by Congress?

Ms. FENCHEL. Absolutely. In our export investigations, the sentencing guidelines were not really created for national security items. The value of these, for instance, a nuclear trigger device may have a value, but there is no guideline for national security in there so we are concerned with this.

Senator COHEN. Thank you, Mr. Chairman. I notice we have a vote on so I will cease and desist. I thank all of you very much.

Senator NUNN. We have seen an awful lot of focus in this country in the last 8 months to a year on Waco and on O.J. Simpson and so forth. I know that the FBI and the CIA are under attack for a lot of different areas, including those I have mentioned.

But I really hope that out of these hearings there will be some balanced view emerging about the continuing very important responsibilities of our law enforcement agencies and the necessity on occasion to penetrate some groups, even religious groups, when they display the kind of tendency for mass destruction or even preach the gospel of mass destruction. It seems to me that there has got to be some attention paid. There is a lot of difference between a religious group and a cult bent on destroying mankind.

I hope that our law enforcement agencies and our intelligence agencies and the people in the Congress conducting hearings in all of these areas will help sort out the proper balance here. It is enormously important that we not go from one problem to just the reverse, and that is my experience in Washington in the last 20 years, is we have a mistake made in one direction, then all of a sudden everybody rushes in the other direction and then we have a terrorist attack and everybody rushes in the other direction and forgets about civil liberties altogether.

There has got to be a balance here, and I hope these hearings will help produce some kind of consensus towards a balance, and I know you have to have that emerge on Capitol Hill and around the executive branch or otherwise you get stampeded into withdrawing and going into a shell after some mistakes have been made.

Senator Glenn, then Senator Levin, and I think we have a vote.

Senator GLENN. I am surprised. Is it policy that we do not follow religious groups, no matter how violent they may be or something? Did I understand you right, Gordon?

Mr. OEHLER. No, that is not right. If there is a reason to believe—if some incident or some other evidence comes up to raise this to where we believe there is a direct threat to U.S. interests, then, of course, we will follow it, as we have the Aum Shinrikyo since they——

Senator GLENN. Do you just not have the resources to follow groups of this size, because here we have a group that is 50,000 people, $1 billion in assets that came out, as you say, that came out later. They are in six countries. They have offices in New York, violently anti-Semitic. Did the Israelis ever tell us anything about this group, because they are violently anti-Semitic. Some of their statements are just ridiculous in that regard.

A group of this size, and we are not following it. I guess my question is, do we not have the resources to put to this?

Mr. OEHLER. There were 40,000 people. The $1 billion is an interesting story. That number came out after the fact. Japanese laws prohibited the Japanese investigative agencies from looking at their finances. One of the lessons that they have learned from this is that they had better take a look at some of their domestic laws and find out if they can follow it somehow.

Senator GLENN. We had branches, though, of this group in this country, too. We had them in this country, too.

Mr. OEHLER. Yes, but a very small cell here.

Senator GLENN. I guess my question is, I am beginning to get a little more nervous than I was when I came in this morning, I guess. Do we think there are other groups of 50,000 members around the world operating like this that we just do not have resources to keep up with?

Mr. OEHLER. Probably the best answer is that we do not know how many groups there are, religious groups around the world that have 50,000 or more members. I cannot give you an answer without doing a survey of how many of the religious groups that we know of have anti-American rhetoric in their writings. I can assure you it would be a lot, particularly in the Middle East.

The question of resources, I think is a very important one, Senator. As you know, the intelligence community's resources have been coming down rather dramatically.

Senator GLENN. Yes, I know. I disagree with that cutback, too.

Mr. OEHLER. And in many ways, as stated by the last several Directors of Central Intelligence, the requirements on the community have gone up. We have worked very hard with our customers in the policy agencies to go over what our priorities should be. This is something that we look forward to working with them and with Congress on in the future, to take a look at, given the totality of our requirements, what should our priorities be.

Senator GLENN. I know we have to run, but I think to have as any policy or even that we hesitate to get into following some of these religious groups, I think is wrong. I do not know what percentage of the world's problems are religious-based, but it is a majority of them, I would think. Look at all the problems in the Mid-East and everything else going on around the world.

Mr. OEHLER. Sure, you can argue that Hezbollah——

Senator GLENN. The human race does all sorts of weird things in the name of religion that endangers the rest of the world and I would think those would be areas of particular concentration, not to stay away from them.

Just one question, and I know Senator Levin has a question or two here, too, before we go. Did we have any indication from the Israeli government that they were following this group? Did we have any information from them about this?

Mr. OEHLER. The overseas part of our relations on terrorism matters rests with the Department of State. They have a group that travels, has traveled throughout the world to discuss terrorism with states around the world. I suggest that we talk to Mr. Phil Wilcox of the Department of State who heads that organization.

Senator GLENN. Maybe we could address some questions to him.

Senator NUNN. Senator Levin?

Senator LEVIN. Dr. Oehler, I will be very brief. If the Chemical Weapons Convention had been in force during the last 2 years, would it have made it harder for the Aum cult to have made their chemical weapons?

Mr. OEHLER. I do not believe so because there were no chemical weapons that traversed any international border.

Senator LEVIN. So precursors of those weapons that are used internally would not be covered by the Chemical Weapons Convention?

Mr. OEHLER. The Chemical Weapons Convention certainly covers the production, stockpiling, and so forth of chemical weapons. So if there is knowledge of that happening, of course, that would apply.

The point I am trying to make is that within a country, it is going to very much depend on local laws, but within a country, the chances are in many countries in the world, laws would not prohibit all of the chemicals that are used, that are listed in the Australia Group, for example, if they are going to internal customers that have no criminal record.

Senator LEVIN. And none of the materials that went into the weapons and the material that the Aum cult were making came from outside of Japan?

Mr. OEHLER. None of the chemicals, to my knowledge. They all came from within.

Senator LEVIN. Was there anything that came from outside of Japan that would be covered by the Chemical Weapons Convention?

Mr. OEHLER. I cannot give you a definitive answer.

Senator LEVIN. Would you let us know that for the record?

Mr. OEHLER. I will. I think that probably the answer is going to be no, but I may be wrong. They had, for example, a Russian gas analyzer, and I would have to check the CW to see if things like gas analyzers and masks would be covered.

Senator LEVIN. Let us know for the record what pieces came from outside of Japan.

Mr. OEHLER. Sure. There are some more in the BW area of the Aum Shinrikyo which I will also include in my response.[1]

Senator NUNN. Thank you very much, Senator Levin.

We have about 8 minutes left on the vote. Dr. Oehler, Ms. Fenchel, Mr. O'Neill, Mr. Holmes, in absentia, and Dr. Young, we appreciate very much you being here. I think out of this comes a keen realization of the challenges out there and the importance of coordination.

I would just leave you with one thought, to have our intelligence and law enforcement not just at the Federal level but at every level working together is more important now than ever before, and I would urge you to do everything you can to improve your coordination.

The second corollary is with our foreign friends around the world. We must greatly strengthen, if we can, every relationship dealing with intelligence and law enforcement relating to terrorism, including the whole element of international organized crime, which I know the FBI is working on. Director Freeh has been in various parts of the world. But I believe that we have a more severe challenge in this area now than ever before. The world is less risky in one sense of an all-out war, but much more risky in terms of this kind of a threat.

Thank you all for being here. For the information of the public, this Subcommittee will continue to direct our major focus in the area of proliferation and international organized crime for the next year. Thank you.

[Whereupon, at 1:18 p.m., the Subcommittee was adjourned.]

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[1] See Exhibit No. 43.

APPENDIX

CISSM

CENTER FOR INTERNATIONAL AND SECURITY STUDIES AT MARYLAND

BIOLOGICAL WEAPONS ARMS CONTROL

Milton Leitenberg

October 25, 1995

Contents

(1) The BW Program of the USSR/Russia
(2) Proliferation of Biological Weapons
(3) Biological Weapon Convention; Negotiations Toward a Verification Capability
(4) Problems and Possibilities of Verification

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Milton Leitenberg, Biographical Statement

Milton Leitenberg is a senior fellow at the Center for International and Security Studies at the University of Maryland. Trained in the sciences, after a half dozen years as an academic, in 1968 he was the first American recruited to work at SIPRI, the Stockholm International Peace Research Institute. He then worked at the Swedish Institute for International Affairs, and the Peace Studies Program at Cornell University.

In the years since 1966, Leitenberg has authored or edited half a dozen books and written over 100 papers, monographs and book chapters. These cover a wide range of subjects in the traditional subjects of arms control - such as nuclear, biological, chemical and conventional weapons, military expenditure, arms transfer, the defense industry, and weapons research and development - as well as actual wars and conflicts and foreign military intervention since the end of World War II. He is presently preparing a book under a MacArthur Foundation grant on the subject of "Humanitarian Intervention and the International Use of Force."

Biological Weapons Arms Control

The Biological Weapons Convention (BWC) was signed on April 10, 1972. The US, USSR, and UK deposited their instruments of Ratification of the Convention on March 26, 1975, and the treaty came into force. It was the first, and for a long time only, post WWII disarmament treaty in which an entire class of weapons of mass destruction was done away with. Or so it was assumed at the time, and the arms control community by and large thought biological warfare had been removed from the scene. Contrary to the nuclear nonproliferation treaty of 1968, there were to be no preferred group of countries that would continue to retain the weapons. Biological weapons were to be prohibited to all, into the future. This was the first major and unique distinction of the subject.

The second was that one of the two superpowers - the United States - which did possess biological weapons, gave them up and destroyed them, even before the treaty came into being:

> "Biological weapons provide a case in which the usual approach to arms limitation was reversed. Instead of first negotiating a treaty and then implementing its provisions, an entire class of weapons was renounced by a major possessor without any prior international agreement. This was in November 1969, when President Nixon, after extensive review, declared that the United States would unconditionally renounce the deployment, procurement, and stockpiling of biological weapons, would destroy all stocks of agents and weapons, and would convert facilities for their development and production to peaceful purposes. In announcing these decisions, he also declared support for the principles and objectives of a draft convention prohibiting biological weapons that had been proposed by Great Britain. Three months later, the United States unconditionally renounced toxin weapons."[1]

The United States chose this policy at the time to dissociate biological from chemical weapons, the combined and historical framework under which arms control deliberations on them had been carried on for many years in Geneva. Article 9 of the BWC was an undertaking to continue negotiations to achieve a chemical weapon disarmament treaty - but an additional 22 years would pass before that would be achieved. The BWC additonally carried no verification provisions; on-site verification was not something that the USSR would consider or accept before Stockholm in 1986 and the INF Treaty in December 1987.

There was however a third major and unique distinction of the BWC: in 1992 Russia admitted that the USSR had been in gross, generic violation of the treaty, the only instance in which one of the superpowers admitted to having been in total violation of a post WWII arms control treaty. By the end of the 1980's it had also become clear that a half dozen or more countries had decided to develop biological weapons in the intervening years. Thus the assumed achievement of the 1970's had been at least in part reversed. Chemical weapons had been used in the war between Iraq and Iran in the 1980's and allied troops that fought Iraq in 1991 ran a risk of being attacked by both chemical and biological weapons. From the mid-1980's, there had also been movement to strengthen the BWC and add some kind of verification provisions to it, particularly once the Chemical Weapons Convention was signed in January 1993. But in 1994 it was also reported that "US military doctrine on nuclear weapons since 1993 has assumed the possible use of nuclear weapons to deter or respond to a chemical or biological attack...," although there is no official US statement to this effect.[2]

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[1] Matthew Meselson et. al., "Verification of Biological and Toxin Weapons Disarmament", Chapter 9 in Verification: Monitoring Disarmament, Francesco Calogera (ed.), Westview Press, Boulder, 1990, pp. 149-164.

All these things placed biological weapons once again on the active arms control agenda. The paper will examine four areas of interest:

- what was learned in recent years regarding the BW program of the USSR, and now Russia, and what is its present status;
- proliferation of BW: reviews of the state of public knowledge regarding those countries known or strongly suspected of having BW programs;
- developments in BW arms control since 1975, and particulary in the last half-dozen years;
- some discussion of the problems of verification of BW arms control.

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[2] "US Nuke Response Is Included in Doctorine", Defense News, November 14-20, 1994, and Theresa Hitchens, "US Must Spell Out BioWar Response," Defense News, September 11-17, 1995.

In the case of chemical weapons, on May 13, 1991, President Bush announced that when the Chemical Weapons Convention went into force, provided that the then-USSR was a participant, the US would not use CW under any circumstances, including for retaliation against a chemical attack. This was reiterated by the Chairman of the U.S. Joint Chiefs of Staff, and in this case, it was assumed that retaliation would be through the massive use of conventional high-explosive munitions.

The Biological Weapons Program of the USSR and Russia

It was not the astonishing harvest of arms control treaties at the end of President Gorbachev's tenure - the INF, START, CFE agreements - and the USSR's admission to having a chemical weapons stockpile, that brought about the exposure and admission of its BW program. It was not even the dissolution of the USSR. It was essentially the result of a crucially positioned defector from the USSR who reached Britain in 1989. As a consequence President Bush and Prime Minister Thatcher both pressed the issue with President Gorbachev. He denied that the USSR had a BW program. It took 3 years for the British and American governments to obtain a Russian admission. It came in a speech by Boris Yeltsin in January 1992 on the eve of his visit to the United States to meet with President Bush, when he referred to "a lag in implementing" the 1972 BWC.[1] On January 19, 1993, the US government released its arms control treaty compliance report for the previous year. It stated:

> "The United States has determined that the Russian offensive biological warfare program, inherited from the Soviet Union, violated the Biological Weapons Convention through at least March 1992. The Soviet offensive BW program was massive, and included production, weaponization, and stockpiling. The status of the program since that time remains unclear."[2]

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[1] Details of the history of events dealing with the USSR's and then Russian BW program between 1989 and 1994, as well as a more detailed treatment of US allegations regarding that program from 1975 on, appeared in a series of four papers:

- Milton Leitenberg, "A Return to Sverdlovsk: Allegations of Soviet Activities Related to Biological Weapons", Arms Control, 12:2 (September 1991), pp. 161-190.
- Milton Leitenberg, "Anthrax in Sverdlovsk: New Pieces to the Puzzle", Arms Control Today, 22:3 (April 1992), pp. 10-13.
- Milton Leitenberg, "The Biological Weapons Program of the Former Soviet Union", Biologicals, 21:3 (September 1993), pp. 187-191.
- Milton Leitenberg, "The Conversion of Biological Warfare Research and Development Facilities to Peaceful Uses", Chapter 8 in Control of Dual-Threat Agents: The Vaccines for Peace Programme, E. Geissler and J.P. Woodall (eds.), SIPRI and Oxford University Press, 1994, pp. 77-105.

[2] "Adherence to and Compliance with Arms Control Treaties", January 19, 1993; pp. 14-15, "The 1972 Biological and Toxin Weapons Convention".

In 1986, after Gorbachev's accession to power in the USSR, the Soviet ambassador to the Second Review Conference of the BWC, held in 1986, had made the following statement to the conference.

> "In accordance with the legislation and practice of the Soviet Union, observance of the provisions of the biological weapons Convention, which was ratified by the decree of 11 February 1975 of the Presidium of the Supreme Soviet of the USSR, is guaranteed by the relevant State institutions of the USSR. The Soviet Union does not possess any of the bacteriological (biological) agents or toxins, weapons, equipment or means of delivery specified in article I of the Convention, nor does it conduct research or development work for the purposes of producing or perfecting that kind of weapon.
>
> ". . . In the Soviet Union, research and development work with the use of micro-organisms and

The United States had noted the USSR's non-compliance with the BWC in its annual reports since 1984.

The program was halted - or at least in part circumscribed - only after extensive pressure by the US and British governments, and following US Senate legislation which forbade US financial assistance to Russian strategic weapon destruction programs unless the US President could certify that the USSR, and subsequently Russia, "was committed to moving toward compliance with all arms control agreements." In April 1992 President Yeltsin announced a decree stating that "It shall be established that the development and implementation of biological programmes in breach of the Convention. . . is not being permitted in the territory of the Russian Federation."[3] In the decree Yeltsin also appointed a Committee headed by Maj. Gen. Anatoly Kuntsevich, formerly deputy head of the Soviet chemical forces, which was to report to him in a month on how to achieve this.[4] In the succeeding months, however, the British and US governments remained convinced that the Russian BW program continued activities that violated the BWC, and in September 1992 they obtained Russian agreement to the establishment of a "trilateral" process of information sharing and mutual site visits in an effort to increase the transparency of the Russian program and to bring an end to its illegitimate activities. The trilateral statement "confirmed the termination of offensive research, the dismantlement of experimental technological lines for the production of agents, and the closure of the biological weapons testing facility" in Russia.[5] It also "dissolved the

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> toxins is conducted exclusively for peaceful purposes, in the interestes of health, the microbial industry, and agricultural production."

Michael E. Kokeiv, "The Reality of Disarmament", Disarmament (United Nations) 10:1 (Winter 1986-1987), pp. 66-72.

[3] "Decree of the President of the Russian Federation on Fulfilling International Obligations with Regard to Biological Weapons", April 11, 1992, two pages.

[4] In September 1992 General Kuntsevich stated in a Russian interview that:

> "Indeed these clear violations on the convention were only admitted after the totalitarian regime collapsed and duplicity in politics was abandoned. . . The remnants of the offensive programs in the area of biological weapons were still around as recently as 1991. It was only in 1992 that Russia absolutely stopped this work. . .
>
> "We did not have stockpiles of biological weapons. The point is that they cannot be kept for a long time. Therefore, the question of their destruction does not come up. . .
>
> "Within the Russian Defense Ministry's structure the relevant directorate has been abolished and a directorate for radiological, chemical, and biological protection has been set up."

Interview with General Kuntsevich in Rossiyskiye Vesti, Sept. 22, 1992, in FBIS-SOV-92-186, Sept. 24, 1992.

[5] Joint Statement on Biological Weapons by the Governments of the United Kingdom, the United States, and the Russian Federation, September 15, 1992, three pages.

See also "Certification of Commitments of Russia: Justification", United States Department of State, department in the Ministry of Defense responsible for the offensive biological programme. . . , cut the number of personnel involved in military biological programmes by 50%, (and) reduced military biological research funding by 30%." That partial reduction was demonstrably less of a curtailment than the zero budget allocation and the "halt (in) Russian research into biological weapons" that President Yeltsin and his then military advisor, General Volkogonov, had promised in February 1992. Reciprocal visits that could take place at any time with unrestricted access to each other's non-military but potentially BW-related facilities were to be negotiated. They were not true "short notice" visits, but in essence, challenge inspections with some caveats had been created. The first visits to a Soviet facility had actually taken place in 1991. There were other important provisions to the agreement as well, and trilateral working groups were instituted so that a continuous process was initiated. Russian government visitors had actually been to the US military BW facility, USAMRIID, at Fort Detrick, Maryland, in mid-1992, just as the USSR dissolved, as well as to the site of a US DoD-contracted vaccine production facility. These visits had in all likelihood been arranged as part of the effort to get the USSR to permit on-site inspection of Russian laboratories outside nominal Soviet Ministry of Defense control that the US was interested in opening up. (See discussion below on the organization of the Soviet BW program.) Nevertheles's, for the next three years the USSR did not permit site visits to its military BW facilities.

US and British concerns continued, however. In April 1994 US officials stated "We have evidence that leads us to understand that there is still an offensive biological weapons program underway (in Russia). . . Yeltsin's decrees have not filtered down to the working levels."[6] There had been virtually no publicly available information in the 18 months between September 1992 and April 1994 on what was taking place inside the institutions that comprised the BW R&D program of the former USSR. Once again, the US and British qualms were substantially based on information from inside the Russian program, delivered by two new defectors, one in the winter of 1992 and the last in the fall of 1993. In addition the US and British inspections in 1993 and 1994 "demonstrated that a 'substantial infrastructure with no commercial purpose' and with links to the Russian military remains largely intact."[7] These issues

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February 10, 1994, p. 8, in respect to the 1972 BWC.

[6] R. Jeffrey Smith, "US Wary of Russian Germ Arms; Despite Assurances from Yeltsin, Effort May Be Continuing", Washington Post, April 8, 1994.

See also Thomas W. Lippman, "Administration Voices Concern on Russian Treaty Compliance; Congress Told Russian Chemical, Germ Weapons Plans Are Suspect", Washington Post, December 11, 1994.

[7] R. Jeffrey Smith, ibid.

had yet again been brought to the attention of Russian President Boris Yeltsin, now by President Clinton during his visit to Moscow in January 1994, during US Secretary of Defense Perry's visit to Moscow in March 1994, and at the September 1994 Yeltsin-Clinton summit meeting. Russia had also submitted its annual BWC data declaration to the UN in April 1994, but it provided "no additions to Russia's 1992 declaration of past offensive BW activities" - the "Form F" submission which was to recount all past offensive programs, going back to 1945 - and US officials had complained that the 1992 Russian submission was even retrogressive in some respects to the one that the USSR had submitted in 1988. One consequence of the second set of discussions was the dismissal of General Kuntsevich on April 7, 1994 as Director of the Russian Presidential Committee on the Problems of Chemical and Biological Disarmament. Another was probably the Russian agreement in May 1995 to now permit inspection visits to the BW facilities directly managed by the Russian military. The visits were to take place in August 1995.[8] As of October 1995 they had not yet occurred. The unclassified version of a special US government report in October 1994 on Russian compliance with biological and chemical arms control agreements stated that "The US continues to have concerns about Russia's compliance with the BWC."[9] Given the history of these events since 1989 - a period of six years - it seems clear that neither the Soviet nor the Russian senior military or political leadership is in any great hurry to have thoroughly done away with residual portions of the USSR's offensive BW program.

What were the parameters of that program? In September 1992 Russian Deputy Foreign Minister Grigory Berdennikov stated that the post WWII Soviet BW program had been in progress since 1946.[10]

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[8] R. Jeffrey Smith, "US Aides Report Progress with Russia on Inspections; No Summit Gains Cited on Other Arms Related Disputes", Washington Post, May 17, 1995.

See also R. Jeffrey Smith, "US to Press Moscow on Alleged Arms Violations", Washington Post, May 9, 1995.

[9] Report on Demonstration of Russian Commitment to Comply with Three Agreements on Chemical and Biological Weapons, 9 pages, undated.

[10] The original sources for the material in this section are for the most part in Leitenberg, 1994, op. cit.

See also:

- Confidence Building Measure F; Russian Submission, 1992.
- Raymond Zilinskas, "Biotechnology in the USSR, Part I", Biotechnology, 2 (July 1984), pp. 610-615; "Biotechnology in the USSR, Part II", Biotechnology, 2 (August 1994), pp. 686-692.
- "The Weapon of Special Designation", Chapter 20 in James Adams, The New Spies: Exploring the Frontiers of Espionage, Hutchinson, London, 1994, pp. 270-283; 337.
- Ogonyok; No. 16, April 1995, pp. 36-37.
- Anthony Rimington, Technology in Transition: A Survey of Biotechnology in Russia, Ukraine, and the Baltic States, Pinter Publishers, London, 1992.

For the most part, however, the Soviet institutes, laboratories and administrative structure that were in violation of the BWC were established after the 1972-75 period, after the United States dismantled most of its BW research apparatus and destroyed its production facility and BW stockpile, and the BWC came into force.

As a result of agreements reached at the Third Review Conference of the BWC in 1986, the USSR agreed to an exchange of information dealing with certain categories of its microbiological research institutions. On 13 October 1987 the USSR provided the first such exchange of information which was subsequently to be deposited annually. It reported five laboratories under Ministry of Defense control: (a) Leningrad (now St. Petersburg); (b) Kirov; (c) Sverdlovsk (now Ekaterinburg); (d) Zagorsk (subsequently also referred to under its pre-1917 name, Sergiyev-Posad), Moscow oblast; and (e) Aralsk, Kzyl-Ordinsky oblast. There was also an open air BW testing ground on an island in the Aral Sea. The Leningrad site was under the jurisdiction of the USSR ministry of Defense Scientific Research Institute for Military Medicine, the remaining four were under the USSR Ministry of Defense Scientific Research Institute for Microbiology.

The 1989 Soviet submission and the disclosures of the Soviet defector, Dr. Pasechnik, in the same year exposed another whole system of laboratories that were heavily involved in the BW program, but were under the control of nominally civilian agencies. These were the All-Union Scientific Institute of Applied Microbiology at Obolensk, the Institute for Ultrapure Drugs in Leningrad, the All-Union Research Institute for Molecular Biology in Koltsovo, and a half dozen other facilities that had been referred to on and off for over a decade in leaks to the press by US intelligence agencies, but also several that had not been so identified, in Moscow, and in Chekhov. A still classified 1992 US intelligence report referred

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A declassified US National Intelligence Estimate of September 1954 ("Soviet Capabilities and Probable Courses of Action Through Mid-1959", NIE 11-4-54, p. 24) indicated no knowledge of specific ongoing Soviet BW programs, and another in 1963 still indicated no knowledge of direct production:

> "We believe that the Soviet Union has an active BW research effort which is suitable to support a complete BW program, but there is insufficient evidence on which to base a firm assessment of Soviet BW offensive activities. However, the USSR has a comprehensive biological warfare defensive program which could lead to an offensive capability. The Soviets have concluded research on antipersonnel, antilivestock, and possibly anticrop BW agents. Although we have identified no mass production facility for BW agents and have no evidence of Soviet stockpiling of such agents, research laboratories and existing plants for the production of vaccines could provide these agents in quantity."

"Soviet Military Capabilities and Policies, 1962-1967", NIE 11-4-63, pp. 56-57.

to "16 known and suspected (Soviet) biological weapons facilities", up from 9 previously "identified", a number that was soon increased to 20. There were also indications that some BW R&D had been carried out in past years in a system of plague research laboratories that the USSR had maintained throughout the country.

This second system of facilities were under the jurisdiction of the USSR Ministry of the Medical and Microbiological Industry, which has mostly been referred to as the "Biopreparat" organization (or Glavmikrobioprom, main administration of the Microbiology Industry). Biopreparat had 25,000 employees and a budget of 100 million roubles per year in the 1980's. However its facilities also produced a wide range of civilian products, and there is no available information to indicate what proportion of its facilities or what proportion of its staff were involved in prohibited BW R&D, although some of the facilities were wholly devoted to BW work.[11] There were 400 people working at the Leningrad (Ultrapure) laboratory, 1,200 at Obolensk, at Kirov, 237 senior scientific personnel, at Koltsovo over 3,000 personnel, but reportedly only about 10 percent of that were senior scientists. General Kuntsevich's successor, General Valentin Yevstigneyev, (who had headed the USSR/Russian BW defense program since 1985) claimed in September 1992 that only "400 scientists in Russia are engaged in the research." That number seems quite low, both for the number that may have been so engaged even in 1992, and most certainly in the 1980's. All in all the overall size of the Soviet BW R&D program appears to have been an order of magnitude or more greater than that of the United States at its peak in the late 1960's. In its 1993 BWC declaration, Russia listed five primary facilities, presumably the five under Ministry of Defense control, and seven others, with a total staff of at least 6,000.

What is perhaps most interesting is what became known regarding the management of the Biopreparat organization, which Deputy Foreign Minister Berdennikov called "one of the best-guarded secrets in the old Soviet Union", and one whose operations the Foreign Ministry professed to know nothing about as late as the end of 1992. It was apparently spun off from the Ministry of Medium Machine Building, one of the former USSR's eight defense industrial ministries, and the one responsible for producing nuclear weapons. It acted as an intermediary for funding and for the supply of resources to its affiliated members, and would therefore appear to have been a smaller and highly specialized analogue to the USSR's Military Industrial Commission (VPK). The important particulars are as follows:[12]

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[11] US Defense Intelligence Agency estimates late in 1994 still referred to 20 facilities with "6,500 to 25,000" workers. ("Russia Denies Biological Weapon Stockpiling", Jane's Defense Weekly, May 13, 1995.) The manner in which the personnel figure was estimated is not known, and it is so uncomfortably wide an estimate - three fold - that it indicates that little is actually known about which facilities are actually doing what.

The names assigned to the Biopreparat organization have changed numerous times, in a manner not atypical of certain Soviet organizations: The All-Union Research and Production Association Biopreparat, The Special Directorate of the Main Administration of the Microbiological Industry, the Main Directorate Biopreparat of the USSR Ministry of the Medical Industry, the State Concern Biopreparat. "On 5 December 1991, it was transferred to the jurisdiction of the Ministry of the Health of Russia. . . It is still run by a general. The facility is guarded, just as before, by warrant officers of the internal troops. . ."

- It was established by Central Committee directive in 1973, and its first head was General V.I. Ogarkov.
- "Technical and scientific documentation was transferred to [it] from the Ministry of Defense." A directorate of the Defense Ministry, presumably the one that directed the Ministry's own biological warfare R&D institutes, was its "customer", and it had "strictly military tasks".
- Its staff, in 1991 composed of 150 managers, operated "independently of the structure to which it technically belonged", and were "officers on loan, who had gained experience at the biological facilities of the Ministry of Defense."
- It was responsible for the construction of the institutes in Obolensk and Koltsovo, but other enterprises as well (two in Vilnius are mentioned) that had nothing to do with the biological warfare programme, and were allegedly a "cover". It also acquired several operating plants.
- Biopreparat was referred to colloquially as "Ogarkov's system", after the name of its first director. The system contained 18 scientific institutes employing 25,000 associates, five plants and a large storage facility in Siberia. Several institutes and plants formerly subordinated to purely civilian departments such as the Ministry of Agriculture and the Ministry of Health also worked for it.
- A "mobilization program and department" was organized within the Biopreparat organization to begin production at short notice. "The equipment was mothballed in special shops (as a rule operating biochemical production facilities were used). Such shops were idle at the Berdsk and Omutninsk Chemical Plants and the Progress Plants in Stepnogorsk. In addition there was a plant within the organization of the Ministry of Agriculture and two plants within the Ministry of Health". It is not stated, but the "short notice" production presumably would have been BW agent and not vaccine. It is very likely that this "mobilization department . . . [and] . . . equipment" is the same "experimental technological lines for production of biological agents" referred to in the

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[12] V. Umnov, "After 20 years of silence the Soviet microbes are talking", Komsomol'skaya Pravda, 30 April 1992, in FBIS-SOV-92-087, 5 May 1992, pp. 4-6.

S. Leskov, Izvestia, 26 June 1993, in JPRS-TND-93-025, 2 August 1993, pp. 13-17.

US, British and Russian statement of 15 September 1992. The "mobilization plan" allegedly specified the quantity and types of agents that were to be produced on command.

- After Dr. Pasechnik's defection in 1989, "the special equipment in the mothballed shops. . . was shipped out", some destroyed and some re-stored elsewhere. Allegedly, documentation was also destroyed.
- There were apparently also other mechanisms of co-operation between the Ministry of Health and Ministry of Defense. Biopreparat, for example, acted as a channel for funding from the Ministry of Health to some of its affiliated institutes. Other indications of close relations between the two ministries were the roles played by senior generals, for example, General Y. I. Smirnov, as Minister of Health. In 1992, the head of Biopreparat was another former General of the Soviet Army's Chemical Troops, Yuri Kalinin.
- The second Biopreparat official who defected reported that offensive BW work had continued within the Biopreparat system even after President Yeltsin's decrees of February and April 1992 and the Russian legislation of August 1992, but that the production plants had been mothballed.[13]

In summary, the Soviet military BW program was quite large, with many facilities, spread across the breadth of the USSR, secret, directed by a branch of the General Staff, and its funding funneled through diverse ministries, including civilian ones. The Defense Ministry's credibility was nil: the General Staff's Directorate for Bacteriological Radiation and Chemical Defense claimed in 1992 - following President Yeltsin's admissions - that all charges of an active Soviet (and then Russian) BW program were lies, and that ". . . all work on biological weapons stopped in 1975."[14] The Directorate was renamed, but it retained its existing staff, and its new head became the man who had headed the Soviet BW program since 1985. The directors of individual laboratories continued to profess the total innocence of their respective institutions, and several strongly resisted the idea of or need for conversion of their R&D programs to civil needs and programs.

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[13] "Last autumn, another defector from the Biopreparat Project came over to British Intelligence to tell his debriefers what steps the Russian military had taken to keep the project going.

"In every facility that had been opened for inspection to Western intelligence, the Russians had established convincing cover stories that made it appear as if each site had been converted to research and manufacture of vaccines. The secret work continued in parts of the sites that were never visited by the American or British officials. At the same time, a secret new facility was being built at Lakhta near St. Petersburg. Far from the Biopreparat biological warfare programme being shut down, it had undergone considerable modernisation. Work is continuing as before, in defiance of Yeltsin's orders."

"At Face Value", The Sunday Times, March 27, 1994.

[14] As late as April 1994 portions of this establishment, with cooperation from sectors of the Russian government - Radio Moscow being state controlled - were not above a little old-fashioned Soviet-style disinformation. Russian inspectors had visited the US pharmaceutical firm, Pfizer, as part of the trilateral exchange visits, and Radio Moscow reported that Pfizer was "producing biological weapons." Pfizer had also "not only preserved but was modernizing the equipment designed earlier to produce biological warfare formulas."

Conversion of these sites should have been particularly easy. Of all the kinds of defense R&D installations, equipment, and personnel, those in the biological and medical related sciences are the easiest to convert.[15] In addition the Soviet Union, and then Russia, was in dire need of every pharmaceutical product imaginable, and domestic vaccine manufacture production standards had been neglected for decades. The needs were obvious, the relevant plants and trained personnel were all there, but matters dragged for several years. Conversion programs were proposed but little seemed to take place. Funding offered by Western nations for research through the International Science and Technology Center (ISTC) offices established in Russia and the Ukraine was delayed by lack of interest in the Russian parliament and by bureaucratic intervention in the Ukraine. It was not until March 1994 that the ICTS could offer funding to Russian and Ukrainian researchers, a delay of some two years.[16] More recently some efforts toward serious conversion have apparently taken place at some of these sites. At Koltsovo and Obolensk, both former Biopreparat facilities, small private venture groups have been established by research staff members to utilize their institute's facilities for production and to market pharmaceuticals needed domestically in Russia. The US Department of Defense has also supplied Nunn-Lugar funds to a US firm entering a joint venture with a former Biopreparat facility at Stepnagorsk, in Kazakhstan, to produce vitamins.[17] In addition to the U.S. Department of Defense, both the U.S. Department of Energy and NASA are funding collaborative projects with laboratories inside former Soviet BW institutions, and

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Radio Moscow World Service, in English, April 12, 1994. The charges were thus the mirror image inversions of those that the US and the UK were making to Russia in the trilateral consultations.

[15] The conversion of both the US and former Soviet BW R&D facilities is discussed in detail in Leitenberg, (1994), op. cit.

[16] - "Trip Report on Symposium on Vaccine Production in Novosibirsk, Russia, December 12-14, 1994", US Department of State, February 7, 1995. (The laboratory in question is the Koltsovo institution.)
- "Report on Bacterial Vaccine Symposium, State Research Center for Applied Microbiology, Obolensk, April 2-4, 1995", US Department of State, undated.

[17] Bill Gertz, "Germ Warfare Gives Way to War on Germs", The Washington Times, April 6, 1995.

particularly, it appears, with those that were in the Biopreparat system.[18] British, Japanese, South Korean, Finnish, Austrian and other pharmaceutical firms have also sought to arrange joint ventures with former Soviet "BW" laboratories. However there is no overall quantitative estimate available as to how much of the plant or personnel that was formerly occupied by the Soviet BW program has actually been converted as of the end of 1995.

There remain the final questions; Why did the USSR gear up a major effort in BW precisely after the BWC came into force? And why was it persistently retained even as the USSR and its military leadership - the General Staff - entered into one major strategic arms control treaty after the other: INF and START, the CFE Treaty dealing with conventional weapons, the acknowledgement of a chemical weapons stockpile, the executive agreement with the United States to withdraw all deployed naval tactical nuclear weapons, and even the dissolution of the Warsaw Treaty Organization, and finally, the USSR itself! Surely each one of these was of far greater military significance than the BW program? Yet they were acceded to, while there has obviously been a determined effort to bluff, procrastinate, conceal, and draw out any disclosure of the BW program, to hold on to it as long as possible, and to avoid putting a definitive end to it.

The first clue is provided by the following description of the policy debate in Moscow at the time that the Biological Weapons Convention was being considered for signature. The author is Arkady Shevchenko, the Soviet diplomat who defected to the United States, and who at the time under discussion was a personal advisor to Soviet Foreign Minister Gromyko.

> "The military branch responsible for this...business has a huge department in the Defense Ministry. It has rejected any kind of international control or oversight. Several times I asked officials there why they were so adamant. The response was always the same: control was out of the question because it could reveal the extent of the development of these weapons and would show Soviet readiness for their eventual use. . .
>
> "While the military strongly opposed any agreement on chemical or biological weapons, the political leadership, Gromyko in particular, felt it necessary for propaganda purposes

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[18] Anne M. Harrington, "Redirecting Biological Weapon Expertise: Realities and Opportunities in the Former Soviet Union," Chemical Weapons Convention Bulletin, Issues #29 (September 1995): 2-5.

Harrington's analysis is narrow and weak on the protential diversity of conversion possibilities, except for one reference to bioremediation. "Commercialization" is not the main point--US has the CDC and numerous analogous national government laboratories working in other R&D areas that impact on social needs. Neither are "products exportable to the West." What is needed is production for and processes that can be applied in the territory of the former USSR.

> to respond to a proposal by Great Britain to conclude a special separate convention to prohibit biological warfare as a first step. The military's reaction was to say go ahead and sign the convention; without international controls, who would know anyway? They refused to consider eliminating their stockpiles and insisted upon further development of these weapons. The Politburo approved this approach. The toothless convention regarding biological weapons was signed in 1972, but there are no international controls over the Soviet program, which continues apace."[19]

A second is a purely formalistic point, but one which nonetheless represents the standard approach of any industrial manager or resource allocator in the former Soviet defense industrial sector. The example provided was given by a Russian analyst explaining the response in 1990 to the cuts in defense ministry orders for major conventional weapons:

> "The majority of the defense industry managers went into a "wait-and-see" state. After all, they were under strict instructions not to tamper with the military production lines, as almost all of these lines belonged to the reserve capacity - or mobilization capacity - which by law cannot be sold or converted to civilian production."[20]

This is not too distant from the 1995 remark of a US administration official directly involved with the Russian BW problem, that "it was easier for them to keep going than to change." As powerful as inertia may be, it does not seem a sufficient explanation for the contravention of a major arms control treaty for twenty years, and particularly in the political climate of the 1987 to 1995 period, nevertheless it undoubtedly was the generic attitude of Soviet defense industrial managers. And not only in the Soviet period. In June 1994,

> ". . . Russian First Deputy Defense Minister Andrei Kokoshin said that the development of dual use technology constitutes one of the main priorities in Russia's defense conversion effort. He said that the Defense Ministry, the State Committee for Defense Industries, and the Economics Ministry were jointly carrying out research in the practical application of dual use technology in hopes of preserving the defense sector's mobilization potential and developing a national industrial policy."[21]

The production lines for BW agents fit the definition of "dual use technology" as perfectly as anything could, and it is just that "mobilization potential", which is referred to in the September 1992 trilateral statement as the "experimental technological lines for the production of agents", that the US and UK want to see dismantled.

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[19] Arkady N. Shevchenko, Breaking with Moscow, Ballantine Books, New York City, 1985, pp. 230-231.

[20] Dr. Alexander Ozhegov, (Analytic Center of the Russian Academy of Sciences) in Lars Wallin (ed.), Proceedings of a Symposium on the Post-Soviet Military-Industrial Complex, Stockholm, October 20, 1993: FOA, The Swedish National Defense Research Establishment, 1994, p. 53.

[21] Radio Free Europe/Radio Liberty News Briefs, 3:27 (June 27 - July 1, 1994), p. 5.

The remaining explanations become more operative and functional, and move in a spectrum from bureaucratic division and inertia to an explicit strategic desire on the part of the Ministry of Defense for having made the BW program in the first place as well as for continuing to maintain it. Some associated with the trilateral process feel that the Soviets assumed for two decades that they could get away with the violation, and "that it has taken them four years to decide whether to tell the whole story, to write the past story."[22] In addition, they have had an even longer time - since 1989 - to "clean up", prepare, remove, consolidate and move parts of the program. But "it's obvious that they have tried to keep the program." It is also pointed out that at any point along the way Soviet officials could have argued against disclosure on the grounds that doing so would admit to the past Soviet violation of the BCW. That is obviously true although the argument loses its meaning since continuing the program only meant that an even more damaging disclosure would follow at some point later on.

When President Gorbachev was pressured on the question by the American and British governments he was apparently "stonewalled" by the Soviet military. His military advisor, General Akhromeyev, was not particularly interested in having the program ended. "The General Staff probably gave him a memorandum stating that the United States is doing the same, and we have to keep the program." It appears that the Soviet intelligence community did not believe that the US had relinquished its own BW program, that President Nixon had actually shut it down between 1969 and 1972, before it was necessary to do so. The upsurge in US expenditure for BW R&D during the Reagan administration may also have fed that suspicion. That increase, of over 500% between 1980 and 1986, raised questions in the United States as well as to whether the program was crossing the boundary between defensive and offensive R&D. For the Soviet military, maintaining any defense capability was desirable, secrecy had "worked" in past instances for the USSR, and it was easy to keep secret. Possibly only a small number of Generals and Colonels were involved, perhaps a dozen. The decision to put the program under the cover of Biopreparat was taken in 1980, although the organization had been established some years earlier. Equally important was the "paranoid" tradition of the Soviet military culture and secrecy: "if the United States wants something of us, they want to hurt us." It is possible that Gorbachev may have suggested that the program be shut down; some reduction in the size of the program took place at that time.

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[22] These and the following quotations are taken from interviews in 1994 and 1995 with a half-dozen present or former government officials - American, British, and Russian - that have been directly involved in the trilateral process, but who cannot be identified.

One is left with the unsatisfactory conclusion that members of the Soviet General Staff saw a strategic advantage in maintaining the USSR's and then Russia's BW capabilities. Why they should have thought that while at the same time being willing to relinquish SS-20 missiles, large numbers of MIRVed ICBM's, all naval tactical weapons, tens of thousands of tanks, etc., still seems to require an explanation that it is impossible to provide.

The Proliferation of Biological Weapons[1]

The years since 1972 and 1975, when the Biological Weapons Convention was signed and then entered into force, have been a severe disappointment for arms control in the biological field. One official US estimate is that "The number of nations having or suspected of having offensive biological and toxin warfare programs has increased from 4 to 10 since 1972,"[2] and as the same statement noted, some of the 10 nations in question "...are signatories of the BWC." A substantial number of these countries are in the Middle East, and these have either not signed or not ratified the BWC. In 1992 the Bush administration made a concerted effort but failed in the attempt to convince several of the major Middle East antagonists to either sign and/or ratify the BW Convention.[3]

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[1] Nicholas Sims argues that it is wrong to speak of "proliferation" of BW, transferring the term from its usage with nuclear weapons.

> "The BW case is entirely different , because there the legal norm is already one of biological disarmament, and has been so for 18 years. So to speak of 'BW proliferation' is misleading; for it suggests, by analogy, the existence of certain recognized (and even semi-legitimate) possessors of BW, whose number it is the object of counter-proliferation policies to keep static. ...This Convention is a disarmament treaty of universal scope, imposing equal obligations on superpowers and other states, large and small, without discrimination. It brings together declared non-possessors of BW. All are of equal status. because the BWC allows no state party to retain weapons, it preserves no group of possessor-states which might be expanded: hence, no logical possibility of 'BW proliferation'."

Nicholas Sims, "The Biological Weapons Convention: Progress Since Its Agreement", presentation to a conference at Wilton Park on Controlling Biological Weapons, July 1993.

I have nevertheless decided to continue using the term in relation to BW, as virtually all authors do.

[2] Barry J. Erlick (Dept. of the Army) in Global Spread of Chemical and Biological Weapons, Hearings, Committee on Governmental Affairs, US Senate, 101st Congress, First Session, February 9, 1989, page 33.

These numbers were first presented in US government testimony to Congress the year before, in 1988, by Dr. Thomas J. Welch of the US Dept. of Defense, to the House Committee on Armed Services.

See also John H. Cushman Jr., "US Cites Increase in Biological Arms", New York Times, May 4, 1988.

Another version of this estimate reads, "During the 20 years the BW Convention has existed, the number of countries considered to be developing or recently engaged in offensive BW programs has risen from 4 in 1972 to 10 in 1992 - some of which are members of the convention." US and International Efforts to Ban Biological Weapons, US General Accounting Office, GAO/NSIAD-93-113, December 1992, pp. 2-3, 16.

[3] Jordan, Lebanon, and Saudi Arabia are parties to the BWC. Egypt and Syria have signed but not ratified. Iraq ratified only after the end of the Gulf War and the UNSCOM process began. Israel has neither signed nor ratified. Iran has ratified, but is widely assumed to be developing biological weapons, and to be in violation, as Iraq was previously.

It was after the failure of that diplomatic effort that the Bush administration inserted a few sentences on the BW capabilities of several of the Middle Eastern states in the non-compliance report that it released in January 1993. Israel, however, was not mentioned.

See also W. Seth Carus, "'The Poor Man's Atomic Bomb', Biological Weapons in the Middle East", Policy Papers No. 23, Washington Institute for Near East Policy, 1991.

With the exception of the USSR and then Russia, and Iraq as a result of the Gulf War and the UNSCOM process which followed it, there has however been no international pressure or penalty applied against any of the suspected BW states. Until around 1988 no national or international spokesman even made reference to the development, and since then, it has been virtually only US spokesmen that have done so. The statements have been constantly plagued however with ambiguities in their descriptive terminology, such as the words "...or suspected of having..." in the statement quoted above. In 1990 the Chief of Naval Operations told Congress that "3 countries worldwide now have bacteriological weapons," and that 15 others were suspected of developing them.[4] Three weeks later the Director of Naval Intelligence identified Iraq, Syria, and the USSR as the three "assessed to have (BW) capability."[5] In 1988, his predecessor, Admiral Studeman, had also identified China, Taiwan, and North Korea by name. But what the US governments' criteria were for the categories of "suspected", "developing", and "capability" was never specified, although in this particular pair of statements "capability" apparently meant weapons possession. A statement in the 1992 British Defense White Paper uses the same pattern of ambiguous phrasing, noting that "about ten (nations) have or are seeking biological weapons." What was worse, the number of nations "developing" or with "capability" were frequently aggregated with those doing the same for chemical weapons. What one wanted to know explicitly was which nations had BW R&D programs, which had gone into weapons development, and which into production and stockpiling of weapons and the BW agents to fill them. That information was publicly unavailable.[6] In 1993 the Russian government released a report which identified nations that had biological weapons programs and which was somewhat more explicit in categorizing their relative stages of development.[7] A larger study on Biological Weapons Proliferation released by two US government agencies in April 1994 contained only three and a half pages out of 90 with information on specific BW proliferating nations, and contained little that was not already in the public domain.[8] Notably, in 1994, two senior US government officials stated that no nation was presently known to be producing and stockpiling BW agents. Iraq had been doing so, but as a result of the Gulf War in 1991 has not been doing so since then. Some countries apparently have BW production and assembly facilities, but maintain them in a standby capacity, and were not at the moment actually producing BW agents in them. Whether such countries had tested weapons, tested the production lines, etc. again remained unstated, but one would have to presume that they had.

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[4] Adm. C. A. H. Trost, House Armed Services Committee, February 20, 1990, p. 5.

[5] Rear Adm. T. A. Brooks, House Armed Services Committee, March 14, 1990, p. 54.

[6] The Chemical and Biological Weapons Elimination Act of 1991 (P.L. 102-182) requires an annual report by the President to Congress which contains a complete list of known or suspected BW programs, including those that are classified.

US government resistance to releasing any information on this subject has been peculiarly severe. Several years of attempts to obtain the declassification of some DIA reports dating from 1975 resulted in little more than a title page, many blank pages, and one paragraph which reported that North Korea had a national Academy of Sciences.

[7] Proliferation Issues: A New Challenge After the Cold War, Proliferation of Weapons of Mass Destruction, Russian Federation Foreign Intelligence Report, (translation), JPRS-TND-93-007, March 5, 1993.

It is interesting to look for a moment at the historical record of allegations regarding national BW programs, and their eventual resolution:

- US allegations between 1976 and the early 1990's of a Soviet program, and even of a continuing Russian one, proved correct. The Soviet denials were false.
- Israeli and other allegations in the late 1980's regarding the Iraqi program proved correct, and the years of Iraqi denials, both before and after 1990, were false.[9]

There are several differences in the lists that have been produced by US and Russian intelligence agencies of nations alleged to have BW programs, and it will be interesting to see the eventual resolution of these discrepancies.

There are also two major historical allegations of BW use in the post WWII period. On both occasions the United States was charged with having used BW. The USSR, China and North Korea accused the United States of using BW during the Korean War[10] and Cuba accused the United States of using BW over a period of decades. In both cases the allegations included the total panoply of BW agents: anti-human, anti-plant (crops), and anti-animal (domesticated).[11] The USSR periodically made other charges that the US had used BW (in the early 1950's, against crops in Eastern Europe; in 1964, in Colombia; in 1968, in Vietnam). The United States has denied all of these charges, and they are nearly universally considered by the international arms control community to be fraudulent and propagandistic allegations. Because of the severely detrimental effect on arms control of fraudulent allegations, the major charges dealing with the Korean War as well as the Cuban ones should have received more serious examination long before this time. They should be either definitively uncovered or definitively disclosed to be fraudulent.

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[8] Biological Weapons Proliferation, Technical Report, US Army Medical Research Institute of Infectious Diseases and the Defense Nuclear Agency, April 1994.

See also, "Technical Aspects of Biological Weapons Proliferation," Chapter 3 in Technologies Underlying Weapons of Mass Destruction, Office of Technology Assessment, US Congress, December 1993, pp. 71-117, and Proliferation of Weapons of Mass Destruction: Assessing the Risks, Office of Technology Assessment, US Congress, 1993.

[9] "Israel Vows Action Against Iraqi Germ Research", The Washington Times, January 19, 1989. (Israeli sources presumably provided the information that was carried in several ABC-TV news reports at roughly the same time.)

[10] Milton Leitenberg, "Allegations of Biological Warfare in China and Korea, 1951-1952", The Prevention of CBW, vol. 5, in The Problem of Chemical and Biological Warfare, SIPRI, Stockholm International Peace Research Institute, 1971, pp. 238-258.

Of more immediate and practical importance is the question of the degree to which BW proliferating states need, obtain, and benefit from technology transfers from industrialized states. For example,

> "Given Iraq's relatively primitive scientific and industrial base in biotechnology, the BTW programme relied initially on access to foreign technology and expertise. Companies from France, West Germany, the Soviet Union, and the United States played important - and only partly unwittingly - roles in Baghdad's efforts to acquire biological weapons."[12]

The Syrian BW program appears to have depended on, and benefited from, similar technology transfers. The issue is of immediate significance due to the continued pressure at BWC Review Conferences and preparatory meetings for additional biotechnology transfers under Article 10 of the Convention, and most particularly, the constant harping on this issue above all by Iran, a nation now suspected of having an active BW program.

There are several aspects to the problem: transfer of plant and equipment, technology, and knowledge, including foreign scientists working in another country's BW program. In the last category, the emigration of former Soviet BW scientists to Iran or other Middle East countries (and some former Soviet BW scientists have gone to developing countries), and South Africans to Libya, has been the more recent concern. Questions can also be raised, however, about US government practices in earlier years. Some of these may very well have acted in the way the US Atoms for Peace program diffused knowledge regarding nuclear technologies, which particular recipient countries may subsequently have redirected to research in their nuclear weapon development programs. For example, in 1967, US military services maintained seven overseas laboratories doing research on infectious diseases: the Army, four; the Navy, two; and the Air Force, one, with a total of over 885 foreign national employees. Did the NAMRU groups - US naval medical research units - situated in Taiwan and Egypt and in part staffed by local scientists, gradually stimulate local government interest in BW?[13] Although a NAMRU unit was never situated in Israel, in some years the US Department of Defense simultaneously provided research contracts to Israeli and to Egyptian scientists on subjects related to BW. Each year some 300 to 400 foreign visitors visit the laboratory facilities of USAMRIID, the United States Army Research Institute of Infectious Diseases at Fort Detrick, Maryland.[14] Other visitors visit DoD contractor laboratories. The great majority of these visits are simply short day-long tours of the laboratories, a very few come to work on projects of up to a year. There are two contradictory ways to appraise the potential of such visits: they could be considered excellent and desirable Confidence Building Measures (CBM's), precisely fitting one of the category of CBM's developed in recent years under the BWC to demonstrate the transparency of national programs. On the other hand they could be considered to carry the risk of transferring knowledge to a potential BW proliferator. There are reportedly a substantial number of Iranian scientists working at the Cuban national biotechnology institute: given the existing strong suspicions of an Iranian BW program, their presence as researchers in another nation's laboratory is far more likely to provide assistance to Iranian proliferation than to produce any benefits of Cuban transparency.

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[11] All of the Cuban charges are summarized, as are other post WWII Soviet allegations of BW use made against the US, on p. 183 of Milton Leitenberg, "A Return to Sverdlovsk: Allegations of Soviet Activities Related to Biological Weapons", Arms Control, 12:2 (September 1991).

[12] J. Tucker, op. cit., p. 237.

The training personnel that accompany turnkey plants, and other technical personnel supplied by contractors for at least initial operation, maintenance, and production, are an obvious path of technology transfer - aside from the equipment itself - to any nation developing a BW program. (It seems that technical personnel from West Germany performed this role in Iraq.) The Enhanced Proliferation Control Initiative (EPCI) of November 1990 enacted by the US administration was aimed at controlling the transfer of dual use technology relevant to biological weapons (as well as chemical and nuclear weapons).[15] Its promulgation very likely owed something to the developments in Iraq, but it was primarily motivated by the fact that the Bush administration had vetoed Congressional legislation that strengthened US nonproliferation policies. In addition, the Bush administration opposed both the Omnibus Export Administration Act of 1991, which encouraged international sanctions against countries that used chemical or biological weapons in violation of international law, and the Nonproliferation of Weapons of Mass Destruction and Regulatory Improvement Act of 1992, which would have denied funding to international development institution until such institutions revoked the membership of countries that did not adhere to nuclear, chemical, and biological nonproliferation regimes.[16] Neither measure was approved by the Congress. The administration opposed both on the grounds that mandatory legislated sanctions would be an infringement on presidential authority. Nevertheless amendments to the provisions of the Arms Control Export Act that were passed by Congress, and were not vetoed, contained requirements that mandated major US sanctions against a country that used chemical or biological weapons. Unfortunately, the same legislation provided the President with the authority to waive the mandatory sanctions on the grounds of US national security.[17] The value of legislated mandates had been made clear in 1989. The United States had accused Iraq of using chemical weapons against the Kurdish population inside Iraq in August 1988. Those allegations led the US Senate to pass legislation imposing economic sanctions on Iraq, overriding strong objections to the legislation by the US Department of State during the Bush administration. Early in 1989, although government officials admitted that they believed Iraq was developing biological agents, they said ". . .that they do not want to get into another public feud with the Iraqis" over the issue - and nothing was done.[18]

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[13] The US Army facility in Thailand employed 325 foreign nationals, the Navy (NAMRU) lab in Taiwan, 285, and that in Egypt, 156. The Participation of Federal Agencies in International Scientific Programs. Report, Committee on Science and Astronautics, US House of Representatives, 90th Congress, 1st Session, 1967, pp. 132-133.

[14] Of 122 foreign visitors selected for a survey in the two years between June 1988 and June 1990, 33 came from the United Kingdom, but the next highest number, 28, came from Israel, and 8 from China.
Defense Research: Protecting Sensitive Data and Material at 10 Chemical and Biological Laboratories, US Government Accounting Office, NSIAD-91-57, July 1991, p. 21.

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[15] - Chemical and Biological Weapons Proliferation; Executive Order 12735, November 16, 1990.
- Fact Sheet on Enhanced Proliferation Control Initiative; The White House, Office of the Press Secretary, December 13, 1990.

[16] Non-Proliferation Regimes: Policies to Control the Spread of Nuclear, Chemical, and Biological Weapons and Missiles, Report to the Committee on Foreign Affairs, US House of Representatives, CRS-FAND, March 1993, pp. 37-38.

[17] It is known that the administration has provided the Congress with many classified notifications of violations of provisions of the act. Due to the classification of these notificationa it is not known if any of the violations pertain to the BW provisions of the act, or to other provisions, and if so, what nation may be responsible, or whether any of the five possible sanctions have been invoked, or waived.

[18] David B. Ottoway, "Official Denies Iraq Has Germ War Plant", Washington Post, January 19, 1989.

The remainder of the section on proliferation is composed of summaries of the available knowledge regarding specific countries having biological weapon development programs.

Nations Having BW Programs At Least Approaching Weaponization

Russia: Ambiguity regarding continuation of offensive program

	US Gov't Arms Control Compliance Reports to Congress (93,95)	Adm.'s Brooks,[1] Studeman,Trost (1988, '90,'91); Sec. Cheney, '90	US and UK governments (1995)	Russian Federation[2] Foreign Intelligence Report, 1993	*The Guardian*[3] (UK, 1991)
Middle East					
Iraq	X	X			X
Libya	X	X		X	X
Syria	X	X			X
Iran	X	X		X	
Israel					X
Egypt	X				X
South/East Asia					
China	X	X			X
North Korea		X		X	X
Taiwan	?	X			X
India[4]				?	
South Korea				?	
Vietnam					X
Laos					X
Africa					
South Africa			X		

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[1] -"Statement of Rear Admiral Thomas A. Brooks, USN, Director of Naval Intelligence, before the Seapower, Strategic, and Critical Materials Subcommittee of the House Armed Services Committee, on Intelligence Issues", 14 March 1990, p. 54.

- "Statement of Rear Admiral William O. Studeman, USN, Director of Naval Intelligence, before the Seapower, Strategic, and Critical Materials Subcommittee of the House Armed Services Committee, on Intelligence Issues", 1 March 1988, p. 48.

- "Statement of Admiral C.A.H. Trost, USN, Chief of Naval Operations, before the Senate Armed Services Committee on the Posture and Fiscal Year 1991 Budget of the United States Navy", February 28, 1990.

- "Remarks Prepared for Delivery by the Honroable Dick Cheney, Secretary of Defense, American Israel Public Affairs Committee, Washington, DC, 11 June 1990", News Release, No. 294-90, p. 4.

[2] Proliferation Issues: A New Challenge After the Cold War, Proliferation of Weapons of Mass Destruction, Russian Federation Foriegn Intelligence Report, (translation), JPRS-TND-93-007, March 5, 1993

[3] *The Guardian*, (UK), September 5, 1991. This source is included because it is assumed to derive its information from UK government sources, which have referred to "around 10" nations with "or seeking" BW. However, the inclusion of Laos and Vietnam seem very dubious, particularly if they refer to the US "Yellow Rain" allegations of the mid-1980s.

[4] In 1994, a Congressional Research Service report included a table of nations either possessing or having "programs" of weapons of mass destruction. For Biological Weapons it listed Russia as the only nation with "possession confirmed," Iraq as "clear intent" (which, by 1994, should also have been in the "confirmed" column), China, India, Pakistan, North Korea, Taiwan, Iran and Syria as "probable possession" and Egypt and Libya as "suspected programs." The interesting--or anomalous--listings are of India and Pakistan, which have not otherwise been included in any unclassified official US listings.

J. M. Collins et. al, Nuclear, Biological and Chemical Weapon Proliferation: Potential Military Countermeasures, Congressional Research Service, 94-528S, July 5, 1994, page 2.

(Other versions of this table, essentially based on the sources in Footnote 1, were published by Elisa Harris (1991), Nicole Ball and Robert McNamara (1990), and Steve Fetter (1991), the Office of Technology Assessment, US Congress, Proliferation of Weapons of Mass Destruction, 1993, p. 82, and Ivo Daalder (1994).)

Of those countries that developed BW after World War II to the stage of weapons acquisition, virtually all either acquired all three categories of weapons of mass destruction (nuclear, chemical, and biological), or at least two and have made attempts at a third:

- the United States, USSR, France, the UK, China, and South Africa procured all three;
- Iraq, had chemical and biological, and was in advanced development of nuclear;
- Israel, has nuclear and chemical; biological is unknown;
- Iran, has chemical and biological; seeks nuclear;
- Libya, has chemical; has sought nuclear for decades, and is seeking biological;
- Syria has chemical and biological;
- North Korea has chemical; sought nuclear, and accepting the Rurrisn assessment, apparently has biological;
- India and Pakistan have nuclear; chemical and biological are unknown;
- Taiwan has chemical, South Korean chemical is ambiguous, and both had incipient nuclear programs in the late 1970's.

According to a statement by former CIA Director Woolsey in 1994, nations developing and procuring BW have usually done so following their procurement of CW, and it has frequently been stated that various Arab states in the Middle East developed chemical weapons because of Israel's possession of nuclear weapons. There are no statements or analyses that have extended this rationale specifically to their development of biological weapons as well, although it is an easy, logical extension to make. In Anthony Cordesman's phrase, "Nations that are interested in biological weapons are already interested because they offer an alternative to nuclear weapons...." It would not be altogether surprising if one learned that some governmental policy group in these states that had considered or was urging the acquisition of nuclear weapons had spun off the suggestion to develop biological weapons. Nevertheless, nothing is publicly known regarding the policy decisions in these states regarding BW development.

IRAQ

Iraq signed the Biological Weapons Convention on May 11, 1972; however it never went on to ratify the treaty. In July 1989, a US administration spokesman, in response to a Congressional committee question which noted that in recent months there had been a series of reports on growing Iraqi capabilities in biological and nuclear weapons, replied,

> "We are concerned by indications that Iraq is seeking to develop a biological military capability. However, we have no evidence that Iraq has violated the 1972 Convention on biological warfare. Under that convention, 'prophylactic research' is permitted."[1]

The response apparently was very much in error, and contrary information was available to the US government and to several other governments at the time that it was made. In January 1989, Anthony Cordesman, then an aide to Senator John McCain and with access to classified information, stated that western intelligence agencies ". . . would affirm that Iraq has biological agents in actual production and is stockpiling them for military use"[2], and in print wrote that there was evidence at the end of 1988 that Iraq ". . . was producing botulinum toxin in military quantities, or some similar agent"[3]. In the same month Secretary of State George Shultz disclosed the Iraqi BW "capability" and the West German government corroborated it.[4] In 1992 Human Rights Watch disclosed the finding of a document captured by Kurdish forces in Northern Iraq which they interpreted as evidence that Iraq had deployed biological weapons in the field during its war with Iran.[5] Following the Persian Gulf War the US Dept. of Defense's official report to Congress stated:

"By the time of the invasion of Kuwait, Iraq had developed biological weapons. Its

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[1] Developments in the Middle East; July 1989; Hearing, Committee on Foreign Affairs, House of Representatives, July 12, 1989, pg. 88.

[2] Anthony Cordesman, remarks to ABC News, January 17, 1989, quoted in Seth Carus, The Genie Unleashed: Iraq's Chemical and Biological Weapons Program, Policy Papers #14, Washington Institute for Near East Policy, 1989, pg. 29.

[3] Anthony Cordesman, "Creating Weapons of Mass Destruction", Armed Forces Journal, --- (February 1989), pg. 56.

[4] Thomas F. O'Boyle, "Bonn Backs US Charge That Iraq Can Produce Biological Weapons", Wall Street Journal, January 23, 1989. Sec. Shultz's remarks were made around January 18, 1989.

[5] Letter to Rolf Ekeus, Chairman, UNSCOM, December 29, 1992, 10 pages, Human Rights Watch. The Iraqi document is dated March 8, 1986, and asks miliatry units to supply an inventory ". . . of Biological and Chemical Materials".

> advanced and aggressive biological warfare program was the most extensive in the Arab world. . . [T]he program probably began in the late 1970s and concentrated on development of two agents - botulinum toxin and anthrax bacteria. ...Large scale production of these agents began in 1989 at four facilities near Baghdad. Delivery means for biological agents ranged from simple aerial bombs and artillery rockets to surface-to-surface missiles."[6]

Before ground combat in Iraq began, official US pronouncements had shifted completely to unqualified statements of Iraq's possession of biological weapons. In September 1990, CIA Director William Webster publicly stated that Iraq had a "sizeable stockpile" of biological weapons, and "US intelligence sources have reported that Iraq has produced a stockpile of biological weapons and will have a 'militarily significant number' of them ready for battlefield use in a few months. . . Officials said that Iraq had worked intensively the past two years to develop a biological weapons program. . ."[7] The US initiated a crash program to produce an anthrax vaccine and to inoculate US service personnel deployed to the Persian Gulf. Obviously the government felt that it had uncovered sufficient information to be convinced that anthrax was one of the agents that the Iraqi BW program had developed for use.[8]

The subsequent disclosure of the nature and dimensions of Iraq's BW program would not have come about if not for Iraq's defeat in the Gulf War and the subsequent unprecedented resolutions by the UN Security Council which imposed a series of demands and constraints on Iraq's military capabilities. These provided for the ability to go anywhere within Iraq at any time to search for and to destroy all of Iraq's weapons of mass destruction in all categories, and to assure that they could not be reconstituted.[9]

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[6] The Conduct of the Persian Gulf War: Final Report to Congress, Washington D.C., US Department of Defense, April 1992; pages 18-19; quoted in Jonathan B. Tucker, "The Future of Biological Warfare", in W.T. Wander and Eric H. Arnett, The Proliferation of Advanced Weaponry: Technology, Motivations, and Responses, American Association for the Advancement of Science, Washington D.C., 1992, p. 54.

Despite the presence of Soviet technical specialists of various sorts in Iraq until the beginning of the Gulf War bombing campaign at the end of 1990, and having expert Russian personnel participating in the UNSCOM BW inspection teams in Iraq, as late as 1993 the Russian F.I.S. proliferation report was coy on the question of Iraq's previous possession of BW. It expressed scepticism of the "conjecture" that Iraq had developed or produced BW weapons.

[7] Molly Moore, "Iraq Said to Have Supply of Biological Weapons", Washington Post, September 29, 1990.

[8] Malcolm W. Browne, "Army Reported Ready for Iraqi Germ Warfare", New York Times, January 6, 1991.

[9] ". . . 8. Decides that Iraq shall unconditionally accept the destruction, removal, or rendering harmless, under international supervision, of: a) all chemical and biological weapons and all stocks of agents and all related subsystems and components and all research, development, support, and manufacturing facilities. . .

"9. Decides, for the implementation of Paragraph 8 above, the following:

Iraq informed the UNSCOM 7 inspection team that visited Salman Pak in August 1991 that BW related work had begun there in mid-1986 and ended in the autumn of 1990, with all research materials destroyed at that time. The UNSCOM team decided however that the program had started earlier, probably in 1983, as that was the year in which the construction of Salman Pak was completed. The facility included the special construction of an aerosol test chamber which had been used for testing botulinum toxin.[10] But once again, first impressions regarding Iraq's BW program underwent a significant change in the course of several years experience. Writing in early 1992, the Special Advisor to UNSCOM wrote "The destruction of biological weapons capabilities has not posed any problem. The relevant major facilities were completely destroyed later during the hostilities."[11] Two years later, by the end of 1994, it was apparent that determining exactly what Iraq had done in the way of biological weapons, where it had been done, and whether or not it was all gone had turned out to be the most elusive task for UNSCOM to resolve. Rather that having been "completely destroyed", Iraq's BW plant was dismantled by Iraq itself, with some portions obliterated and others cached. For a year and a half Iraq denied having any BW program at all, and once it admitted that position to be false, its successive series of submissions to UNSCOM over a period of two and a half additional years were one after the other considered misinformation for the greatest part. As it eventually turned out - in August 1995 - that was most certainly the case. At the end of 1994 a report to the UN Security Council by the UN Secretary General had stated

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"(a) Iraq shall submit to the Secretary-General, within fifteen days of the adoption of this resolution, a declaration of the locations, amounts, and types of all items specified in paragraph 8, and agree to urgent, on-site inspection as specified below. . .

"i) the forming of a Special Commission, which shall carry out immediate on-site inspection of Iraq's biological, chemical, and missile capabilities, based on Iraq's declarations and the designation of any additional locations by the Special Commission itself; ii) the yielding by Iraq of possession to the Special Commission for destruction, removal, or rending harmless. . .

"10. Decides that Iraq shall unconditionally undertake not to use, develop, construct, or acquire any of the items specified in paragraphs 8 and 9 above and requests the Secretary-General, in consultation with the Special Commission, to develop a plan for the future ongoing monitoring and verification of Iraq's compliance with this paragraph, to be submitted to the Council for approval within 120 days of the passage of this resolution."

[10] Chemical Weapons Convention Bulletin, No. 13, September 1991, p. 22.

The 1983 date would also corroborate the statement by an Iraqi microbiologist who defected to Iran and claimed that Iraq had developed and tested biological agents as early as 1983. Shyam Bhata, "Iraq Scientist Tells Ten Year Secret", The Observer, August 9, 1992.

[11] Johan Molander, "The United Nations and the Elimination of Iraq's Weapons of Mass Destruction: The Implementation of a Cease-Fire Condition", in From Versailles to Baghdad: Post-War Armament Control of Defeated States, Fred Tanner (editor), United Nations (UNIDIR), New York, 1992, p. 151.

> ". . . Iraq's attitude to the provision of data and supporting evidence still fell far short of its obligation to provide full, final, and complete disclosures of its past proscribed programmes and of its current and recent dual-purpose capabilities subject to ongoing monitoring and verification. It appears that many of Iraq's declarations are incomplete and sometimes contradictory. The Commission has both direct and indirect evidence that Iraq is still failing to declare equipment and material acquired for and capable of use in proscribed programmes and that its accounts of certain of its projects do not reflect their true purpose and their role as part of now proscribed weapons programmes. In general, in relation to past programmes, Iraq has not volunteered information and has shown marked lack of transparency, disclosing information only when confronted with evidence by the Commission. Iraq maintains its claim, not believed by the Commission, that it has destroyed all documentation related to these programmes and that no other tangible proofs exist to support its accounts. Indeed, events of the past six months have strengthened the Commission's conviction that important documentation still exists and that the Iraqi authorities have taken the conscious decision not to release it freely to the Commission. In any case, Iraq has not fulfilled its undertaking to resolve all outstanding issues in relation to the past programmes in parallel with the establishment of ongoing monitoring and verification. The importance of doing so has been repeatedly impressed upon Iraq at each of the high-level meetings referred to above. as has the need for Iraq to provide documentation and supporting evidence."[12]

The UNSCOM report of December 15, 1994 demonstrated - by the exquisite use of Iraq's own misstatements and utter ineptness - that Iraq has been persistently lying in its submissions on BW to UNSCOM and continued to do so.[13] In addition, Rolf Ekeus, director of UNSCOM, stated that Iraq's troop buildup along the Kuwait border in the fall of 1994, which produced a responding US force deployment, was designed to pressure the UN into halting its insistence that Iraq divulge all information on its past BW program.[14] Finally, at the end of 1994, UNSCOM discovered that Iraq had procured 39 tons of bacteriological growth media in 1988 alone, and additional quantities in 1989, as well as high technology fermenters and spray drying and weapons filling machinery. The data regarding these purchases was supplied by some of the countries whose firms had made the sales - but not until the winter of 1994. The growth media had been imported in large bulk packaging, unsuitable for domestic medical uses, in quantities 1000 times larger than Iraq's declared legitimate amounts, and the whereabouts of about half of that media - or its products - were still unaccounted for.[15] Ekeus' comment was "This can only coincide with the production of biological weapons."[16]

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[12] United Nations Security Council, Note by the Secretary General, S/1994/1422, December 15, 1994, pp. 3-4.

[13] United Nations, Security Council, Note by the Secretary General, S/1994/14422/Add 1, December 15, 1994, pp. 10-14, pg. 26. See also Report of the Secretary General, United Nations Security Council, S/1994/1138, October 7, 1994, pp. 22-27, pg. 36; Barbara Crossette, "Iraq Hinders Arms Monitors, UN Panel Reports", New York Times, December 21, 1994, R. Jeffrey Smith, "Secretive Iraq Parries UN Arms Inspectors; Technology, Patience Pry Open Weapons Data", Washington Post, November 4, 1994.

[14] R. Jeffrey Smith, "UN Aide Links Iraqi Troop Thrust to Frustration on Disclosure", Washington Post, October 27, 1994.

The denouement came in two steps, in July and August 1995. The first, and smaller, step came in July. Very likely at the strong urging of France, Russia, and China, all of whom favored ending the sanctions on Iraqi oil sales and on imports, which Iraq was continuously demanding should be revoked, Iraq finally admitted to having had an offensive BW program. The Iraqi government stated that:

- it had produced very large quantities of anthrax and botulinum toxin,
- the production site had been Al Hakam, which had never been bombed,
- "Iraq never had bombs or other weapons that could be filled with either of the agents",
- the stockpiles of both agents had been destroyed in the fall of 1990 before the Gulf War, "to prevent contamination of the Iraqi countryside during enemy bombing raids",
- the program was originated in 1985, at a supposed pesticide plant at Muhanna, one site of Iraq's CW munitions production. R&D continued there for a year, and then was transferred to the German constructed laboratories at Salman Pak.
- Agent production began in 1989, a year after the end of the Iran-Iraq war.

All this was reported to Rolf Ekeus, verbally, in half an hour. No evidence to support any of the claims was presented; Iraq promised to provide details in a written report at the end of July.[17] On July 17, Iraq also said that it would cease cooperating with UNSCOM inspectors unless economic sanctions against Iraq were lifted by the end of August. On August 4 Iraq did turn over a report of 530 pages to UNSCOM, whose details were never made public, but in which it followed its verbal presentation of the previous month, and still insisted that no weaponization had taken place.[18]

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[15] United Nations, Security Council, Note by the Secretary General and Annex, S/1995/284, April 10, 1995, pp. 16-22, pg. 34; Barbara Crossette, "Iraq Hides Biological Warfare Effort, Report Says", New York Times, April 12, 1995; Julia Preston, "Iraqi Accounting of Biological Arms Inadequate, UN Report Says", Washington Post, April 11, 1995.

[16] "Biological Weapons Program in Iraq Larger Than Believed", Los Angeles Times, February 28, 1995.

[17] - R. Jeffrey Smith, "Iraq Had Program for Germ Warfare; Bug Stockpiles Destroyed, UN Team Told", Washington Post, July 6, 1995.
- "Four Years of Lies", Washington Post, July 7, 1995.
- "Baghdad's Biological Arsenal", New York Times, July 7, 1995.
- Jack Anderson and Michael Binstein, "Iraqi Confession Raises More Questions", Washington Post, July 10, 1995.

Within days Iraq was forced to make far more significant disclosures. On August 7, Lt. General Hussein Kamel Hassan Majeed, Saddam Hussein's son-in-law and the former head of Iraq's entire program of development and production of weapons of mass destruction - nuclear, chemical, and BW - defected to Jordan, together with his brother, (also a Saddam son-in-law), their families, and some 15 additional military officers.[19] After failing in an attempt to obtain the defector's return, and then in an apparent assassination attempt, on August 16 Iraq called Rolf Ekeus to Baghdad and offered "100 percent compliance" and withdrew the deadline for cooperation. In the circumstance of potential disclosures by the most well-informed defector possible, the Iraqi government decided to preempt that eventuality by making them itself. They contradicted even the information provided to UNSCOM only a month before in July:

- within days after the UN Security Council Resolution in December 1990 authorizing the United States and a coalition of nations to wage war against Iraq, Iraq had loaded anthrax, botulinum, and aflatoxin on nearly 200 bombs and SCUD missile warheads. (50 bombs and 10 SCUD missiles with anthrax, 100 bombs and 15 missile warheads with botulinum, and 16 bombs with aflatoxin - or 165 bombs and 25 missiles.)
- The weapons were destroyed - allegedly - in July and August 1991, more than four months after the war's end.
- Iraq had also experimented with a drone aircraft BW delivery system, but in the event had decided to arm the other systems. Thus, three BW delivery systems in all had been developed.
- BW production sites were hidden "in ordinary factories and engineering centers." Seven BW agents, including viruses, had been tested for possible use, and production of agents had taken place at four other sites in addition to Al-Hakam.

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[18] "Iraq Gives UN Data on Arms; Details Revealed on Germ Arsenal", International Herald Tribune, August 7, 1995. Given what followed in a matter of days, a substantial amount of this document was probably again concocted misinformation, and two weeks later, Iraq asked that its August 4 report should be considred invalid.

[19] - Nora Boustany, "Relatives, Top Aides of Saddam Defect to Jordan", Washington Post, August 11, 1995.
- Youssef M. Ibrahim, "Senior Army Aides to Iraq President Defect to Jordan", New York Times, August 11, 1995.
- "Trouble in the Family", Newsweek, August 21, 1995, pp. 14-15.
- Daniel Williams, "US Questions Top-Level Iraqis; Saddam Calls Defectors Judas", Washington Post, August 12, 1995.

- Iraq had produced ten times more anthrax than it had previously admitted to (presumably, in its August 4 report).
- Iraq had also developed "a wheat pathogen", which UNSCOM later reported to be wheat rust, and a mycotoxin.
- Iraq didn't use the BW weapons it had armed due to a warning of massive US retaliation if Iraq used weapons of mass destruction. The warning was delivered by US Secretary of State Baker to Iraq's then Secretary of State Tariq Aziz, in Geneva in January 1991. The US was at the time actually concerned about possible use of chemical weapons by Iraq. Aziz claimed the Iraqi leadership interpreted the US threat as a possible use of nuclear weapons.
- Finally, in a "comic encore", as they drove him to the airport, Iraqi officials stopped at a chicken farm and handed Ekeus 5,500 documents, which they had "just discovered", claiming that the defector, General Kamel, had hidden them from UNSCOM.[20]

On October 11, 1995, UNSCOM's report based on the half million pages of documents that Iraq had handed over in August was presented to the UN Security Council.[21] Aside from the details already indicated, all of which were repeated in the report in more detail, including the amounts of BW agents that Iraq had produced, there were several additional points of particular importance. First, the Iraqi government had made a policy decision as early as 1974 to acquire biological weapons. Second, of course, that the Iraqi government had lied in claiming that all documentation had been destroyed in 1991. The newly delivered documents, however, were for the most part only from individual research and production centers, and several major categories of files were still missing, those from the major central policy and management agencies, the Military Industrialization Corporation and the Ministry of Defense. Third, UNSCOM was skeptical of the detailed progression of the BW R&D program from the mid-1980s to 1990 that Iraq had described: "Given the Iraqi claim that only five years had elapsed since its declared inception in 1985, the achievements of Iraq's biological weapons program were remarkable." Finally, UNSCOM indicated even greater skepticism regarding Iraq's description of when and how it had destroyed the filled BW munitions. Iraq claimed that the order for the destruction had been given orally, there were no records of the destruction, and Iraqi officials were contradictory on the dates of the destruction and unable to identify the site at which it took place.

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[20] - Barbara Crossette, "Iraq Gives UN Fuller Details on Its Germ Warfare Program; System More Advanced Than Admitted in Past", New York Times, Aug. 23, 1995.
- R. Jeffrey Smith, "UN Says Iraqis Prepared Germ Weapons in Gulf War; Baghdad Balked, Fearing US Nuclear Retaliation", Washington Post, August 26, 1995.
- Barbara Crossette, "Crash Nuclear Program by Iraq is Disclosed", New York Times, August 26, 1995.
- Christopher Dickey, "Secret Weapon", Newsweek, September 4, 1995, pp. 14-15.

[21] Note by the Secretary-General, and Annex: Report of the Secretary-General on the Status of the Implementation of the Special Commission's Plan for the Ongoing Monitoring and Verification of Iraq's Compliance with Relevant Parts of Section C of Security Council Resolution 687 (1991), S/1995/864, October 11, 1995; and R. Jeffrey Smith, "2 Monitoring Groups Accuse Iraq of Withholding Data on Weapons," Washington Post, October 12, 1995.

The most critical issues that the report made clear, however, were the following:

- UNSCOM found that Iraq's submissions still continued to be deficient and that the data available from "...other sources...does not correspond in important aspects to the information provided by Iraq" regarding its BW programs. It was clear that large categories of documentary files were still being withheld.
- The "clear deception" that Iraq had practiced before: Iraq had been lying regarding its other programs in weapons of mass destruction.
- And that UNSCOM had been fooled and had previously accepted Iraq's submissions in the nuclear, chemical, and ballistic missile areas.

UNSCOM's realization of that embarrassment was obviously going to make it extremely reluctant to make the same mistake a second time.

Aside from the particulars of the disclosures, there were several major lessons in this four year escapade, but apparently still not its final denouement. First, that the Iraqi government had lied continuously, even as late as in its July 6 "disclosures" and its August 4 "Full, Final, and Complete Disclosure." Iraq's credibility is nil, and everything must be verified. Second - under conditions of a police state determined to lie - that UNSCOM and the inspections were not able to turn up major portions of the relevent evidence regarding documents, culture media, research personnel, destruction or non-destruction of agents, etc, only strong suspicions as a result of discrepancies. Ekeus' deputy noted in August that "Iraq has now acknowledged 'a much more extensive program than UNSCOM had been able to piece together over four years through a process of gathering independent information outside the country and then confronting Iraq with it."[22] Finally, that it would have been catastrophic to have revoked the sanctions, as Iraq continuously demanded and its UN Security Council advocates - Russia, France, and

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[22] B. Crossette, Aug. 23, 1995, op. cit.

China - urged, prior to UNSCOM's absolute certainty that Iraq had thoroughly complied with the original provisions of the UN Security Council's resolutions.[23] Clearly, Iraq had hoped to get the economic sanctions lifted without fully disclosing its BW program. Only the defection of General Kamel in August ruined that plan.

The developments at the end of August 1995 still left some of the basic questions concerning Iraq's BW program unanswered or only partly answered:

(1) where did the production equipment come from? and the cultures for R&D and production?

(2) How many scientists worked in the program, at what institutions; where were they trained?

(3) was there external assistance by non-Iraqi scientists, or technology transfer in addition to the purchase of technology?

(4) what organisms were developed for weapons systems, and how far did weaponization go; for which kinds of munitions or delivery systems, and how large was the stockpile?

Partial information for some of these parameters is known, but to an important degree more complete answers are still unknown or not in public domain, and await further reports from UNSCOM.

Equipment and Agents

Equipment, technology and materials were procured from France, West Germany, the USSR, and the United States.[24] In November 1974, Iraq contracted with the Institute Merieux for the establishment of Iraq's first vaccine production plant, primarily for veterinary vaccines, including anthrax. In the late 1970s a second French company built a second vaccine plant, with very substantial overcapacity. In 1980-81 Iraq contracted with a West German Thyssen subsidiary to build the laboratory facilities at Salman Pak. Fermenters and bacterial strains were purchased beginning in 1985. Nearly 50 bacterial culture samples were bought between 1985 and 1989 from the American Type Culture Collection.[25] Other bacterial cultures were also procured from France and Great Britain. In 1989 Iraq bought a wide variety of biotechnology equipment from various German supply firms, and additional fermenters, also from Germany. Altogether, 24 West German firms were involved in the construction of production facilities for biological and chemical weapons in Iraq; the chemical weapons production infrastructure being by far the larger of the two.[26] UNSCOM believed that Iraq may have been working with the organisms that produce anthrax, botulinum toxin, gas gangrene, brucella, tularemia, tetanus, cholera, tuberculosis, and plague, as well as three organisms for simulant R&D.[27] During the late 1980s US intelligence services reportedly tracked the exports of dual use equipment that could be used for producing biological weapon agents from European countries to Iraq, and concluded that Iraq had spent approximately $100 million on its BW program between 1980 and 1990, and at the time of its invasion of Kuwait, was producing and stockpiling BW agents at perhaps a dozen sites within Iraq.[28] Iraq had also procured 15 agricultural sprayers from an Italian firm for use for bacterial insecticide spraying by aircraft.

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[23] Rolf Ekeus, "Iraq: The Future of Arms Control", Security Dialogue. 25:1 (1994), pp. 7-16.

Ironically, on August 26 France's UN Security Council representative, and that of Russia were quick to make the best of the newest Iraqi turnabout.

[24] Jonathan B. Tucker, "Lessons of Iraq's Biological Warfare Program", Arms Control, 14:3 (December 1993), pp. 229-271. See also W. Seth Carus, The Genie Unleashed: Iraq's Chemical and Biological Weapons Program, Policy Papers #14, Washington Institute for Near East Policy, 1989; Eric Nadler and Robert Windram, "Deadly Contagion: How We Helped Iraq Get Germ Weapons", The New Republic, February 4, 1991, pp. 18-19.

Personnel.

According to its disclosures to UNSCOM, Iraq claimed to have operated and managed this entire program with one or two Ph.D. level and one to three masters level scientists, in addition to about 100 laboratory technicians and a larger number of support personnel.[29] Another report indicated that Iraq reported to UNSCOM that "10 scientists" had been engaged in the BW program.[30] This is extremely implausible, if not to say impossible, judging by nothing more than the number of culture types that were acquired. This is one area in which one can most particularly expect to see further disclosures. The cultures were procured by a half dozen nominal institutions or ministries, but these may conceivably have been way stations to the laboratories that actually received and worked with the cultures. Salman Pak is assumed to have been one of these sites.

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[25] US Chemical and Biological Warfare-Related Dual Use Exports to Iraq and Their Possible Impact on the Health Consequences of the Persian Gulf War, A Report, Committee on Banking, Housing, and Urban Affairs, US Senate, May 25, 1994, pp. 264-275.

[26] "Firms Said Involved in Iraqi CW Projects", Hamburg DPA, in FBIS-WEU-89-015, January 25, 1989, pg. 5; "Doing Business with the Misery of Others", Der Spiegel, January 23, 1989, in FBIS-WEU-89-015, pp. 5-9.

[27] ref #24 (above), pg. 276; "UN Probes Iraq on Chemical Weapons", Washington Times, December 20, 1994.

[28] J. Tucker, December 1993, op. cit., pp. 240-241.

[29] Raymond Zilinskas, "UNSCOM and the UNSCOM Experience in Iraq", presentation to the panel on UNSCOM at the American Society of Microbiology meetings, May 22, 1995; to be published in Policy and the Life Sciences, August 1995.

The individual that Iraq declared to have been the head of their BW program, Dr. Rihab Taha, took her doctorate degree at a British university. However, if there were a far greater number of scientists involved in the Iraqi BW program than has so far been declared, it would seem plausible that Dr. Taha was not likely to have been the program's head, either. In circumstances where it is generally assumed that Iraq did not make a full disclosure of its past activities, Iraqi officials would presumably not have chosen to place its actual BW program head at the point of the direct brunt of UNSCOM's questioning. Iraq sent its students for training in microbiology for the most part to European universities, particularly British ones. Iraq has a half-dozen medical schools that could be presumed to have Departments of Pharmacology and/or Microbiology in their faculty, in addition to several technological institutes that might also be able to train researchers in relevant disciplines. It has been estimated that there may be 20-30 microbiological scientists in Iraq at the Ph.D. level, with an additional number in teaching positions in universities, and between 50 and 100 with masters degrees. Scientists in many other disciplines could additionally have participated in different aspects of a BW R&D program. In its August 1995 disclosures, Iraq detailed exactly such collaboration and assistance to its BW program by other of its weapon development institutes and personnel: weaponization was carried out with the assistance of Iraq's chemical weapons establishment at Muthanna.

External Assistance

It has been suggested that European companies were misled, unknowingly, in providing the basic infrastructure of Iraq's BW program. Certainly, technical experts would have remained at the sites constructed as turnkey plants, to ensure that startup proceeded properly, to see that plant personnel were trained, that equipment was maintained properly. In addition to the West German and French equipment referred to previously, Iraq also reportedly procured fermenters from an Italian company, Olsa, and a Swiss company, Chemak.[31] A West German TV report in January 1989 claimed that ". . . scientists and technicians from the Federal Republic had helped in the construction of a biological weapons factory south of the Iraqi capital", which could have been either Salman Pak or Al-Hakam.[32] When the issue was raised by the SPD opposition in the German parliament, the government replied that it ". . . has no real proof usable in court of involvement by German firms and senior employees in the development of bacteriological weapons in Iraq". No further details have appeared on the numbers of West German personnel that were in Iraq, for how long, and precisely what they did, beyond the identification of several of the construction firms noted previously.

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[30] Alan George, "Fears of Iraqi Biological Weapons Don't Abate; Officials Verify Scientists' Efforts", Washington Times, December 24, 1994. (The above comments expressing my scepticism of the Iraqi claims regarding personnel were written in June 1995; the disclosures in August make certain that hundreds of Iraqi scientists had to have been involved in the BW program.)

In 1994, James Woolsey, then Director of the US Central Intelligence Agency, stated that the Iraqi BW capability hadn't been harmed by the war or by the inspections. Al-Hakam had escaped bombing in 1991, and its equipment was partially removed to warehouse storage after the war's end, sites which have since been visited by UNSCOM inspectors. Writing early in 1993, an assistant to the Director of UNSCOM summarized the inspection and control situation at that time in a most pessimistic light:

> "Iraq signed up to the cease-fire conditions in the UN Security Council Resolution 687. While this resolution was adopted under Chapter VII of the Charter, and hence binding on all states, including Iraq, and remains so, Iraq was required to officially acknowledge its acceptance of its terms for cease-fire to enter into effect. This it did on 6 April 1991. In other words, Iraq chose to accept the conditions contained therein rather than the consequences of not signing up. Furthermore, as a cease-fire arrangement, if Iraq were subsequently found to be in material breach of the terms, a legal case could be made that the situation post ante would prevail again. Therefore, it was reasonable to assume that Iraq, however reluctantly and even if it argued that it had accepted the terms under duress, would abide by its obligations under that resolution. . .
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> "The UNSCOM process was initially envisaged as having three phases:
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> "1) Full disclosure by Iraq, through written declaration, of all aspects of its past programmes to acquire the weapons banned to it under the terms of the cease-fire and its holdings of such weapons, backed up with the verification of these declarations by means

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[31] William Safire, "Iraq's Threat: Biological Warfare", New York Times, February 16, 1995.

[32] Hamburg DPA, op. cit. See also T. F. O'Boyle, 1989, op. cit.

of open-sources, immediate on-site inspections, and information provided to UNSCOM by Member States;

"2) UNSCOM, together with the IAEA in the nuclear area, would supervise and verify the destruction of Iraq's current holdings of weapons, ancillary systems, and facilities for their production, testing, and repair; and

"3) Establishment of twin regimes to monitor Iraq's imports and exports on the one hand, and its indigenous dual-capable civilian industry on the other, in order to ensure that Iraq did not reacquire the banned weapons systems and means for their production. . .

"While, as noted above, Iraq formally accepted in writing the terms of the cease-fire resolution, it has never acknowledged its obligations under Resolution 707 and 715 (1991). Indeed, it has gone so far as to call them 'arbitrary', 'illegal', and such as to 'undermine the UN Charter'. Recently, Iraq has said that it will never accept Resolutions 707 and 715.

"This issue is crucial to the fulfillment of UNSCOM's mandate. Without the full declarations demanded in Resolution 707, UNSCOM can never make a determination that it has found all Iraq's banned weapons capabilities. Without Iraq's acknowledgement of the terms approved by Resolution 715 for long-term monitoring of its obligation not to reacquire the banned weapons capabilities, UNSCOM cannot be sure under what terms monitoring would proceed once sanctions and the oil embargo were lifted. Consequently, if Iraq maintains its current position, UNSCOM will not be able to determine that it has identified all banned weapons capabilities, that it has destroyed them, and that it is effectively monitoring the long-term situation. . .

"Each time Iraq was found to have lied or concealed items, or sought to obstruct UNSCOM in its work or to limit its rights, questions were raised about the motives for such actions and Iraq's long-term intentions, with the consequence that the burden of proof on Iraq increased. The longer Iraq fails to cooperate fully and honestly, the more UNSCOM will be forced to resort to more intrusive methods in order to obtain the information necessary for it to conclude its task. UNSCOM introduced, at an early stage, U-2 aerial surveillance and its own helicopters for the transportation of inspection teams. It introduced new types of inspections, such as document searches, and subsequently introduced aerial surveillance from helicopter too. . .

"Future prospects depend on two prime factors: Iraq's actions and the continued solidarity of the Security Council in its determination to see Iraq comply. Without the latter, UNSCOM can hope to achieve little more. Currently, it has to be assumed that Iraq would seek to reacquire the banned weapons systems as soon as sanctions are lifted and the inspection regime discontinued or rendered inefficient. But, if Iraq cooperated, the process could move forward very quickly. Efforts must, therefore, concentrate on convincing Iraq that it is in their own best interest to cooperate. For this to happen, Iraq must be made to believe that the determination of the Council is unmovable and that sanctions will not be lifted until Iraq is in compliance. Conversely, Iraq must also have the incentive that, if it meets the Council's demands, sanctions will be lifted."[33]

With the latest disclosures on the Iraqi BW program in August 1995 being so drastically different from all that preceded it, it is possible that a major break in the situation has been achieved, but its completeness remains to be verified.

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[33] Tim Trevan, "Assessment of the UNSCOM Verification Process", in Steven Mataija & Lynn Bourque (editors), Proliferation and International Security: Converging Roles of Verification, Confidence Building, and Peacekeeping, CISS, York University, Toronto, Canada, 1993, pp. 151-154.

CHINA

The United States arms control compliance reports of 1993 and 1994 stated that "the United States believes that it is highly probable that China has not eliminated its BW program since becoming a State Party to the Convention in 1984".[1] The same passage had been deleted by presidential assistants in 1991 and 1992 from both classified and unclassified versions of the report for reasons that are disputed. Chinese officials denied the charge when questioned by Bush administration officials. The 1995 compliance report was only slightly more expansive:

> "The United States believes that China had an offensive BW program prior to 1984 when it became a party to the BWC. . . The United States government believes that based on available evidence, China maintained an offensive BW program throughout most of the 1980's. The offensive BW program included the development, production, stockpiling, or other acquisition or maintenance of biological warfare agents. China's CBM mandated declarations have not resolved concerns about this program and there are strong indications that China probably maintains its offensive program. The United States government, therefore, believes that in the years after its accession to the BWC, China was not in compliance with its BWC obligations, and that it is highly probable that it remains noncompliant with these obligations."[2]

Further information appeared in a 1993 press report:

> "The US intelligence community is worried that China may have revived and possibly expanded its offensive germ weapons program, according to current and former US intelligence officials.
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> "The officials said that, if true, the Chinese effort would violate Beijing's nine-year-old pledge of adherence to an international treaty barring development, production, and stockpiling of toxin and biological agents and the weaponry to deliver them.
>
> "US officials are also concerned that neighboring Taiwan may have maintained a germ weapons program of its own, which also dates from the 1970s -- a circumstance that they say may have encouraged the Chinese to continue their program.
>
> "The officials said US concerns about China are partly based on evidence that China is pursuing biological research at two ostensibly civilian-run research centers that US officials say are actually controlled by the Chinese military.
>
> "The research centers were known to have engaged previously in production and storage of biological weapons, the officials said. They said US suspicions intensified in 1991 when one of the suspect biological centers was enlarged. Suspicions heightened further last spring, after Beijing made what one US official termed a 'patently false' declaration

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[1] "Adherence to and Compliance with Arms Control Agreements", June 23 1994, US Arms Control and Disarmament Agency, pp. 11-12. (The sentence was exactly the same in the 1993 report.)

[2] "Adherence to and Compliance with Arms Control Agreements", May 30, 1995, US Arms Control and Disarmament Agency, pp. 15-16

to the United Nations that it had never made any germ weapons or conducted any work, permitted under international treaties, to bolster defenses against a biological attack.

"But under President George Bush, they said, senior White House officials repeatedly stripped a strong expression of concern about the suspected Chinese germ weapons program from unclassified versions of an annual report on arms proliferation that the intelligence community prepared for Capitol Hill.

"Only last month did the intelligence report, which is required by law, state for the first time in an unclassified passage that 'it is highly probable that China has not eliminated its BW program' since agreeing to do so in 1984. Bush approved the little-noticed report on Jan. 19, his final full day in office, before sending it to the House and Senate committees on foreign affairs.

"The White House deleted this conclusion about China's activities - a conclusion representing a consensus of all relevant US agencies - from both classified and unclassified versions of the report in 1991 and 1992, the officials said, causing some intelligence analysts to accuse the White House privately of political censorship."[3]

The operative sentence regarding Taiwan in the 1994 compliance report reads

> "There is some evidence to indicate that Taiwan may have a program, but the evidence is not sufficient to determine if Taiwan is engaged in activities prohibited by the BWC."

and in the 1995 report,

> "The United States believes that Taiwan has been upgrading its biotechnology capabilities by purchasing sophisticated biotechnology eqipment from the United States, Switzerland, and other countries. . . The evidence indicating a BW program is not sufficient to determine if Taiwan is engaged in activities prohibited by the BWC."

(The Russian 1993 proliferation report states that "Taiwan does not have biological weapons.")

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[3] R. Jeffrey Smith, "China May Have Revived Germ Weapons Program, US Officials Say", Washington Post, February 24, 1993.

It is possible that the two laboratories are the Institute of Epidemiology and Microbiology Chauaping, in Beijing, and the School of Medicine in Shanghai; laboratories at these two sites placed orders for strain cultures with the CDC in 1988 and 1990. Although that alone is not evidence of a treaty infraction, it may serve to identify the institutions

SOUTH AFRICA

A surprising disclosure was made in February 1995: South Africa had initiated a biological weapons program in 1985 and had maintained it until quite recently.[1] Although production had reportedly ceased, British and American diplomats were attempting to persuade South Africa to destroy any remaining materials as well as research records and documentation. Allegedly, however, "President Mandela has been unable, despite repeated requests, to persuade his military to relinquish the blueprint. . ."[2]; ". . . Mandela's government is not in full control of South Africa's biological weapons program, a State Department official said."[3]

The situation has been aggravated by a second factor, the possible diffusion of technology or process information to a second state: "US intelligence sources reportedly tracked Libyan agents trying to gain materials, scientists, or information on the program from South African arms and military establishments."[4] President Mandela subsequently acknowledged that South Africans involved in the country's chemical weapons program, which had allegedly been closed down in 1993, had gone to Libya, and he added weakly, "we cannot prevent anybody from visiting Libya and we cannot take away the knowledge that they have."[5]

The South African program reportedly produced toxins used for the assassination of opponents of apartheid. However, if weapons were produced, means of assassination would not have been all the program was intended for. A spokesman for Deputy President de Klerk claimed that South Africa had initiated its BW program because Angolan forces had used chemical and biological agents in combat against South Africa.[6] The claim is a canard, but no correction was ever made by South African officials. There are no known allegations of Angolan use of BW, and in the alleged instance of CW use, US intelligence assessments concluded that chemical weapons had not been used.

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[1] James Adams, "Qadaffi Lures South Africa's Top Germ Warfare Scientists", The Sunday Times (London), February 26, 1995.

Paul Taylor, "Toxic S. African Arms Raise Concern; US Wants Assurance '80s Chemical, Germ Weapons Program is Dead", Washington Post, February 28, 1995.

[2] Adams, ibid.

[3] Taylor, ibid.

[4] Taylor, ibid.

[5] "Chemical Arms Experts May be 'Visiting' Libya", The Baltimore Sun, March 3, 1993.

As for the institutions in which BW R&D might have been carried out in South Africa, the National Institute for Virology, in Johannesburg, and the South African Institute for Medical Research have highly qualified virology facilities, but it is not publicly known if the BW R&D work was carried out at these sites or if it was done in a dedicated and closed military facility. As of the fall of 1995, no further information had become available regarding the South African program, such as the agents it had worked with, the degree of weaponization, or the number of researchers it occupied.[7] It is important to note that the unclassified versions of the annual US arms control treaty compliance reports never referred to South Africa. This raises several questions: did the classified versions contain such information, or was information on the BW programs of nations such as South Africa (and possibly Israel) omitted from the classified versions as well? The combination of the disclosure of the South African program, its absence from the compliance reports - in 1995 as well - and the disclosure that reference to China was omitted in 1991 and 1992 even from the classified compliance reports due to an administrative decision by the Office of the President - make this a plausible question.

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[6] Taylor, op. cit.

[7] The South African embassy in Washington and the Institute for Defense Policy in Johannesburg have refused repeated requests to provide any further information regarding the former BW program.

IRAN

The 1994 US compliance report states that "The United States judges that Iran probably has produced biological warfare agents, and statements by Iranian officials suggest that it has weaponized a small quantity of those agents."[1] The 1995 report was slightly more expansive:

> "The Iranian BW program has been embedded within Iran's extensive biotechnology and pharmaceutical industries so as to obscure its activities. The Iranian military has used medical, education, and scientific research organizations for many aspects of BW procurement, research, and production. Iran has also failed to submit the data declarations called for in the CBM's... Iran probably has produced biological warfare agents and apparently has weaponized a small quantity of those agents."[2]

The Russian FIS report was, on the other hand, decidedly equivocal, stating that "Iran does not have offensive biological weapons at this time. But it is possible to say with confidence that there is a military-applied biological program."[3] In 1988 and 1989 Iran attempted to procure both fusarium and mycotoxin-producing fungi from Canada and the Netherlands for a laboratory at the Iman Reza Medical Center, Meshed Medical Science University, which also does research on chemical weapon agents.[4] A number of Iranian microbiologists have worked in the Cuban National Center for Genetic Engineering and Biotechnology in Havana.

In replying to a series of questions from the US Senate Committee on Government Affairs, the US Central Intelligence Agency in one instance stated that "Iran and Iraq have missiles and aircraft capable of carrying nuclear, biological, or chemical warheads. . . but we believe these countries only have chemical and biological warheads", and in another instance that "we have no specific information to discuss about Iran's biological warfare efforts."[5]

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[1] "Adherence to and Compliance with Arms Control Agreements", June 23, 1994, US Arms Control and Disarmament Agency, pg. 12.

[2] Adherence to and Compliance with Arms Control Agreements, May 30, 1995, US Arms Control and Disarmament Agency, p. 16.

[3] "Proliferation Issues; Russian Federation Foreign Intelligence Service Report", March 5, 1993.

[4] Michael Gordon and Stephen Engelberg, "Iran is Said to Try and Obtain Toxins", New York Times, August 13, 1989; Purver, op. cit., p. 35.

[5] "Proliferation Threats of the 1990's", Hearing, Committee on Governmental Affairs, US Senate, Feb. 24, 1993, pp. 180 and 183.

NORTH KOREA (DPRK)

The unclassified versions of the arms control treaty compliance reports released by the United States government do not mention North Korea in regard to BW.[1] In response to a specific question from a Senator in 1993, the CIA stated

> "We have almost no information on whether Pyongyang seeks to build biological weapons. Nevertheless, North Korea - if it desires - has the capability to develop classic biological agents such as anthrax, plague, or yellow fever."[2]

A US Defense Intelligence Agency report on North Korean military capabilities published in 1991 implied that North Korea was not working on BW.[3] The South Korean Defense White Paper of 1993-1994 says only "Since the early 1960s North Korea has been pushing forward with research and development as well as acquisition of biological and chemical weapons and protection and detection equipment in preparation for biological and chemical warfare."[4] Although providing further details on North Korean chemical weapons and production, it contains not another word on biological weapons. The Russian Foreign Intelligence report is substantially more suggestive:

> ". . . North Korea is performing applied military-biological research at a whole series of universities, medical institutes, and specialized research institutes. Work is being performed at these research centers with pathogens for malignant anthrax, cholera, bubonic plague, and small pox. Biological weapons are being tested on the island

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[1] "Adherence to and Compliance with Arms Control Agreements", June 23, 1994, US Arms Control and Disarmament Agency, pg. 184. The May 1995 version of the same (unclassified version) report again does not mention North Korea.

[2] Proliferation Threats of the 1980's, Hearing, Committee on Governmental Affairs, United States Senate, 103rd Congress, First Session, Washington, DC, February 24, 1993, p. 184.

[3] "Biological warfare has not received the same attention as chemical or nuclear warfare. This could be because North Korea lacks the technical expertise or because the difficulty in controlling biological warfare, makes it a less desirable option. North Korea realizes that biological weapons are as dangerous to its own forces as they are to South Korean or US forces, and the North's limited medical services would make the agents more lethal. Therefore, using biological agents is not a likely option. However, if North Korea did choose to employ biological weapons, it probably could use agents such as anthrax, plague, or yellow fever against water and food supplies in the South's rear area."
"North Korea, The Foundations for Military Strength", US Defense Intelligence Agency, November 1991, pg. 62. There is no apparent reason why the agents mentioned should therefore have been indicated.

Efforts since 1992 to obtain declassification of DIA and CIA documentation regarding North Korea have resulted in obtaining no more than the title page of a 1975 (!) study: "Biological Warfare Capabilities - Asian Communist Countries (U);" Defense Intelligence Agency; ST-CS-03-148-75; CY, ST-S-4-2704.

[4] Defense White Paper, 1993-1994; The Ministry of National Defense, The Republic of Korea, Seoul, Korea, 1994.

> territories belonging to the DPRK. No information indicating that these programs are offensive in nature has been received."[5]

The final sentence is a contradiction in terms: The testing of biological weapons is by definition "offensive", and in violation of the BWC.

One author, with information apparently derived from a combination of Korean Central Intelligence Agency and US Defense Intelligence Agency sources, has claimed that North Korea has a dedicated BW program, has identified institutions allegedly participating in that program, that it is producing biological munitions, and is additionally aiding other countries "with the technology and assistance required to develop, produce, and offensively employ chemical and biological weapons", alleging such cooperation for BW in particular between the DPRK and Syria.[6] There is no other corroboration for these allegations. He suggested that:

> "Reports suggest that there are two laboratories and four research facilities engaged in this research. Included within these are the Institute of Microbiological Diseases at the Academy of Medical Science, the Medical Research Institute at the Academy of National Defense Sciences, and a facility known only as the 'No. 25 Factory.' Some advanced genetic research is currently occurring within Kim Il-Song University. Whether this is connected to the DPRK's BW program is presently unknown."
>
> "It has not been determined when the DPRK actually initiated the production of biological agents for offensive employment. Such a capability currently exists and is believed to have existed at least since, the early 1980's, possibly earlier. Limited production of biological agents may be conducted at research facilities but it is possible that separate production facilities exist."

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[5] Proliferation Issues: Russian Federation Foreign Intelligence Service Report, pg. 29.

[6] Joseph S. Bermudez, Jr., "North Korea's Chemical and Biological Warfare Arsenal", Janes Intelligence Review, May 1993, pp. 225-228.

In a 1989 manuscript ("Korean People's Army NBC Capabilities", February 5, 1989), Bermudez had written

"While the Soviet Union and the PRC have definitely provided the DPRK with chemical agents, they are not believed to have provided any direct assistance in the development of biological weapons. Such capabilities are believed to have been developed indigenously. DPRK biological warfare research is believed to have begun sometime during the mid-1960s and to have focussed on 10 different strains of bacteria including: anthrax, cholera, bubonic plague, smallpox, and yellow fever. At present, it is believed that the DPRK has not employed genetic engineering or advanced bio-technology to develop these bacteria. The primary facilities engaged in this research are the "National Defense Research Institute" and the "Medical Academy." However, the exact location of these facilities is presently unknown. It is not known whether the DPRK actually initiated the production of biological agents for offensive employment. However, such a capability presently exists and is believed to have existed since at least the early 1980s and possibly earlier. Limited production of biological agents may be conducted at the "National Defense Research Institute and the Medical Academy", however, it is more probable that there exists separate production and research facilities."

In 1994 a South Korean publication carried information, allegedly supplied by a North Korean defector, that identified, in addition to a "Chemical-Biological-Radiological Research Center" associated with the North Korean armed forces:

> "North Korea's bacteriological-weapons-related organizations include Kim Il-son University, Pyongyang Medical College, Pyongyang Military Medical College, the Institute of Microbiological Diseases under the Pyongyang Academy of Science, the Bacterium Research Institute under the Second Academy of Natural Sciences."[7]

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[7] U Chong-chang; Seoul Chugan Choson, June 30, 1994; in FBIS-EAS-94-126; June 30 1994, pg. 38-43. The greatest portion of the article concerned the North Korean nuclear program, alleging underground nuclear tests and other reputed details which cast great doubt on the credibility of any of the information provided in the entire article.

Other Countries: Syria, Egypt, Libya, India, Israel

Syria:

The 1995 US compliance report states

> "Syria has signed but not ratified the BWC. . . The United States Government reaffirms its previous judgment that based upon the evidence available to date, it is highly probable that Syria is developing an offensive biological warfare capability."

The Russian F.I.S. report claimed the opposite:

> ". . . There is no reliable information about the existence of biological weapons in Syria or a directed program for the creation of an offensive potential in the biological realm."

Egypt:

The 1995 US compliance report states

> "Egypt has signed but not ratified the BWC. . . The United States believes that Egypt had developed biological warfare agents by 1972. There is no evidence to indicate that Egypt had eliminated this capability and it remains likely that the Egyptian capability to conduct biological warfare continues to exist."

The 1993 Russian FIS report is contradictory, stating both the presence and absence of BW agents:

> "The country has a program of military-applied research in the area of biological weapons, but no data have been obtained to indicate the creation of biological agents in support of military offensive programs. The research programs in the area of biological weapons date back to the 1960's. As we all know, in the early 1970's President As-Sadat confirmed this, announcing the presence in Egypt of a stockpile of biological agents stored in refrigerated facilities. Toxins of a varying nature are being studied and techniques for their production and refinement are being developed at the present time by a national research center."

Libya:

The 1995 US compliance report states

> "Evidence suggests the Libyan government is seeking to acquire the capability to develop and produce BW agents. Such development or production would violate key provisions of the BWC. Libya has also failed to submit the data declarations stipulated in the CBM's. . . Evidence indicates that Libya has the expertise to produce small quantities of biological equipment for its BW program and that the Libyan Government is seeking to move their research program into a program of weaponized BW agents."

The reference to ". . .seeking to acquire. . ." presumably refers to recent attempts to procure information from South African scientists. The 1993 Russian F.I.S report went a bit further:

> "There is information indicating that Libya is engaged in initial testing in the area of biological weapons. At this stage the Libyans are displaying particular interest in information on work involving biological agents overseas. In contacts with representative of other Arab countries, Libyan specialists are expressing a willingness to fund joint

> biological programs, including ones of a military-applied nature, provided that they are not undertaken on Libyan territory."

India:

Only the 1993 Russian F.I.S. report makes reference to India:

> "India does not possess offensive biological weapons. However, it does have considerable potential in the field of biotechnology. The nature of the work of certain civilian research centers cooperating with the Defense Ministry suggests that its results could be used for military-applied purposes, primarily in a defensive aspect. No fewer than five military centers are involved in developments in the military-biological area. The programs being conducted by these research centers are of a classified nature."

It is known that the Indian government examined the question of whether it should initiate a BW program some time around 1970, roughly at the same time as it made the final decisions to construct a nuclear weapon.

Israel:

As long ago as 1974, US military officials testified to the Senate Armed Services Committee that they had been informed by Israeli counterparts that Israel had an offensive chemical capability.[1] In response to a question by Senator Nunn, General Almquist replied that he did not know about a biological capability. It became known in 1993 that the USSR had recruited the former Deputy Director of the Israeli BW R&D program, Dr. Markus Klingberg, as a spy.[2] He was arrested by Israel in 1983. He had worked at Ner Ziona, "a top secret institute near Tel Aviv that does research in chemical and biological warfare."[3] Notably, Israel has never been listed by the US as maintaining a BW R&D program, nor is it referred to at all in the unclassified versions of the annual arms control treaty compliance reports. The Russian F.I.S. report released in 1993 stated in regard to Israel: "There is no direct evidence of the presence of biological weapons in Israel."[4]

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[1] FY 1975 DoD Authorization Hearings, Part 5 (R&D), Senate Armed Forces Committee, March 7, 1974; pg. 4931.

[2] "Zwolf Jahre Gefangis Fur Israelischen Oberst; Sprunage Zugunsten der Sowjetunion", Nieu Zurcher Zeitung, September 2, 1993.

[3] Clyde Haberman, "Israel Lifts Secrecy Veil from Spy Convictions", New York Times, May 4, 1995.

[4] Proliferation Issues: Russian Foreign Intelligence Service Report; in JPRS-TND-93-007, March 5, 1993, pg. 24.

The Potential Use of BW by Extra-national, or "Terrorist" Groups.

There have been many warnings over a period of several decades of the possible use of BW by terrorist groups. The reason given is the ostensible ease of preparation of such agents. Nevertheless to this date no such use has ever taken place. The most serious attempt to produce an agent, which nevertheless failed, was made by the Japanese Aum Shinrikyo group in the early 1990s. The same group did go on to manufacture and use the chemical agent Sarin in 1994, and then in March 1995 in Tokyo. There is also a record of threats by several groups or individuals to use BW, and some indication of the nature of these can be given.

The first thorough review of this subject, a substantial monograph titled Chemical and Biological Terrorism, became available in June 1995.[1] The author divided his examination into five parts:

(1) threats to use BW, without any evidence of actual capabilities,
(2) unsuccessful attempts to acquire BW,
(3) actual possession of BW agents,
(4) attempted unsuccessful use of such agents,
(5) their actual "successful use."

I have selected several events recorded in the past thirty years by way of example of developments in this area:

(1) In the 1960's Robert Depugh, the owner of a veterinary medical products supply company named the Biolab Corporation, in the state of Missouri, headed the largest paramilitary right wing organization in the United States, the Minutemen of America. He claimed to have ". . . a number of our

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[1] Ron Purver, Chemical and Biological Terrorism: The Threat According to the Open Literature; Canadian Security Intelligence Service, June 1995, pp. 3 to 57.

See Also:

Jeffrey A. Simon, Terrorists and the Potential Use of Biological Weapons: A Discussion of Possibilities. RAND Corporation, R/3771-AFMIC, December 1989.

B.J. Berkowitz, et. al., Superviolence: The Civil Threat of Mass Destruction Weapons, ADCON Corporation, A 72-034-10, September 1972.

"Terrorism and Biological Weapons", pp. 35 to 44 in Technology Against Terrorism: Structuring Security, Office of Technology Assessment, January 1992.

Robert S. Root-Bernstein, "Infectious Terrorism", Atlantic Monthly, May 1991, pp. 44-50.

own physicians and bacteriologists working on the production of biological agents. . . Most of this research goes on after hours in public and private institutions where they hold a regular job during the day and have an opportunity to moonlight a few hours in the evening on their own." He claimed that his associates were researching classical BW R&D subject matters, ". . . such as. . . the selective breeding of various pathogens in order to increase or decrease their virulence and to renter them resistant to antibiotics."[2] He referred to equine encephalitis virus as one of seven agents his group had selected to work on. He also claimed that he had personally produced Sarin at his company's facilities "and elsewhere across the country". None of these claims were ever validated by any other source, and there is no knowledge that any of the agents implied were actually ever produced, or were ever used. It is not known whether any of the claims were more than bluster and a demonstration of the ability to use the right phraseology.

(2) An attempt was made to extort funds from the Brandt government in Germany in 1973 by an individual or group threatening to pollute "shopping centers, hotels, factories, and city water systems with deadly bacteria".[3] Nothing occurred following the blackmail attempt.

(3) Somewhere between 1980 and 1984 (ostensibly equally expert sources with access to classified US government records dispute the date) the bathroom of a Paris apartment was found to contain flasks of clostridium botulinum. The apartment was a "safe house" of the West German Red Army Faction, also known as the Baader Meinhoff Group. Although the public record does not indicate that the material was produced at that location, the work is attributed to one of the group's members, Silke Maier-Witt, who was a medical assistant by profession.[4]

(4) Some time in the mid-1980s the Tamil Elaam secessionist groups, waging a war of secession in Northern Sri Lanka, released a communique threatening to wage biological warfare against the

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[2] Eric Norden, "The Paramilitary Right", Playboy Magazine, June 1969, pp. 103-104, 146, 242-264.

[3] "Bacteria Terror Threatened in West German Extortion Bid", International Herald Tribune, November 23, 1973.

[4] Ron Purver, op. cit., pp. 36-37.

government.[5] They described four operations that they could carry out. Two of these targeted the human population: the transport and introduction of the natural vectors for River Blindness (a snail) and Yellow Fever (mosquitoes) into the south of the country. The remaining two were threats of transporting and introducing two anti-plant agents, against the rubber trees and tea bushes which make up two of Sri Lanka's major export products. The Tamil Elaam was a group that had unquestionably demonstrated an aggressive willingness to take virtually any action - massacres, assassination of the Indian head of state (Rajiv Ghandi) as well as that of Sri Lanka and other senior Sri-Lankan politicians, the use of suicide volunteers - and some facility with using somewhat advanced technologies, such as demolition frogmen. The communique which stated their intentions sounded as if they knew what they were doing. Nevertheless there is no evidence of their having carried out any of the four BW operations. (After the March 1995 events in Tokyo they also threatened to use Sarin in attacking government (military) facilities.)

(5) In March 1995, two members of an American right wing militia, "the Minnesota Patriots Council were convicted of conspiracy charges for planning to use a lethal biological poison called ricin to kill Federal employees and law enforcement agents".[6] Ricin would technically be considered a toxin. The conspiracy was apprehended before any actual use occurred.

(6) In 1995 a member of an American right wing racist group (Aryan Nation) who was a qualified microbiologist and maintained a small laboratory in his basement, ordered samples of bubonic plague from the American Type Culture Collection, because "he needed the bacteria to conduct 'biomedical research using rats to counteract immanent invasion from Iraq of super-germ carrying rats'", or, alternatively, "because he (was) writing a research book".[7] The individual was arrested, and the cultures, as well as explosives, were recovered.

(7) On March 20, 1995, members of a Japanese religious sect, the Aum Shinrikyo (Supreme Truth) released Sarin gas in a carefully prepared attack in the Tokyo subway system. Mortality was

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[5] Rohan Gunaratna, War and Peace in Sri Lanka, Institute of Fundamental Studies, Sri Lanka, 1987, pp. 51-52.

[6] Bob Herbert, "Militia Madness", New York Times, June 7, 1995.

[7] Michael Janofsky, "Looking for Motives in Plague Case", New York Times, May 28, 1995.

fortunately quite low. The same group had also intentionally released Sarin a year before, with several deaths resulting, but had not been apprehended. Following the 1995 attack Japanese police began a months long process of searching the extensive facilities owned by the sect - over a hundred individual buildings and sites - something which had not been done previously. In addition to hundreds of tons of intermediate chemicals that had been stockpiled for the production of chemical weapons, police discovered that the sect had been attempting for several years to prepare botulinum toxin for use as an aerosol weapon. "160 barrels of peptone" media were found in one of the buildings in the village of Kamikuishiki, also the site of the group's CW production facility.[8] The group had procured four fermenters, a vacuam dryer and a milling machine, and had tested their product on guinea pigs. However, in several years of efforts the group had failed to produce botulinum toxin.[9]

There are two significant aspects of the Aum Shinrikyo attempt. The first is that although it appears to have been the most serious attempt on record, and as will be seen in a moment, with no lack of resources and time, it failed. The second is that the perpetrating group was most certainly not an ordinary "terrorist" group. It would be useful therefore to look at both the characteristic of the group, and the resources that it applied to produce a BW agent:

- it was a religious sect.
- its teachings were apocalyptic.
- its devotees were exposed to classical aspects of the more severe forms of indoctrination and "brainwashing": enforced isolation, psychological deprivation, forced separation of family members, isolated living, food deprivation, etc.
- it had abducted and killed civilians that it considered "enemies".
- the leadership of the group, at least at one time, had political presumptions; some 25 of its members had run for seats in Japan's parliament only a few years before.
- the group was administered as a miniature government, with "ministers" and sectorial responsibilities. Its leader "apparently envisioned a 'sovereign state' with its own government and the ability to wage

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[8] Andrew Pollack, "Japanese Police Say They Found Germ-War Material of Cult Site", New York Time, March 29, 1995 (as reported by Mainichi-Shimbun).

[9] Kyle Olson, personal communication, May 26, 1995. See also Ron Purver, op. cit., pp. 153-190; pp. 164-166 and 168-170 pertain in particular to the group's attempts in BW.

war with guns, bacteria, or nerve gas".[10]

- it had a most extravagant access to financial resources, estimated as being between 1.2 and 1.6 billion dollars.
- it maintained several front companies for procuring advanced western production equipment and extremely large stocks of chemical intermediates.
- it had also recruited a small staff of qualified scientists, ("around thirty..."), some of them at the post-doctoral level and with experience in industrial and medical R&D. These supervised about 100 laboratory technicians. These, with the combination of funds, western equipment, and industrial intermediaries, had succeeded in producing Sarin.

Despite continual apprehensiveness on the part of experts over the decades, there have been no instances of BW use by terrorists. This has frequently prompted the question of "why not?"

It seems very likely that experts and analysts have been much too "optimistic," and that BW isn't all that easy for an untrained group to produce. In addition, other things may be very much easier to do and the materials to carry them out acquired, or more readily provided by patron states. Sophisticated plastic explosives were available by the ton, digital timing devices are legally purchasable. In some instances, the relative discreteness of effect of an explosive may be what the terrorist group desires; however, if an explosive device is placed in a market place or a bus station, it is difficult to imagine that the terrorist group would not be quite satisfied--in fact, would consider it altogether desirable--if it could kill ten or 100 times as many people in the same act. To produce BW, one does need a laboratory, equipment, and appropriate knowledge and experience; the failure of the Japanese Aum group after several years of effort in this respect would indicate exactly that.

Except for the Aum case, in which the effort to produce a BW agent did not succeed, no evidence has appeared over the decades indicating whether BW was considered by terrorist groups, if so, why it was rejected, or if not, why it was not. For example, in the case of the quite specific Tamil Elam threat described above, it is not known if the threat was never more than a bluff, or if there ever was any serious intention and effort to carry it out at any point.

It is frequently argued that the acts of terrorist groups are intended to gain the sympathy of the public for their cause, and that the use of BW would presumably be counterproductive from that viewpoint. However, historical experience undercuts that basic premise. It is clear that terrorist groups do not mind killing people, including innocent civilians in sizable numbers. The sabotage of aircraft (Lockerbie, French airliners over Africa) and bombings (from market places, taverns and department stores to

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[10] Andrew Pollack, "Japanese Sect May Struggle to Get by Without Its Leaders", New York Times, May 17, 1995.

Oklahoma City and the World Trade Center, the latter carrying the potential of deaths in the thousands) make that clear. They also don't hesitate to assassinate heads of state or other major political figures (Indira and Rajiv Gandhi, Lord Mountbatten, Aldo Moro, attempted assassination of Prime Minister Thatcher, etc.), which earns them no sympathy at all, not even in the eyes of a selected or targeted population to whom the act might be assumed to appeal. They have their own cost-benefit analyses regarding the desirability of particular acts they carry out, and the assumed consideration that they would not do something that would alienate the general public and cost them its sympathy is not substantiated. (Although not a traditional "terrorist" group, the use of CW by the Japanese Aum group would certainly bear this out.) In addition, the aim of some terrorist groups is not to gain adherents or earn public sympathy, but simply to disrupt society, and, in some cases, even to topple the national government.

Biological Weapons Arms Control Since 1975

The Biological and Toxins Weapons Convention (BWC) entered into force in 1975 and currently has over 130 States Parties.[1] The BWC prohibits the development, production, and stockpiling of microbial or other biological agents, or toxins, of types and in quantities that have no justification or prophylactic, protective or other peaceful purposes, and weapons, equipment, or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict. The BWC was also of unlimited duration, and additionally provided that if a majority of the parties to it agreed, review conferences could be held every five years. These majorities were obtained, and a review conference has been held every five years since the BWC came into force in 1975.

There were, however, two major drawbacks to the Convention. First, there was no prohibition on research; all research was permissible. Therefore the development and production of "quantities" that could be justified for "protective", or defensive research, were permitted. There was no mention of "offensive" or "defensive" research -"research" was not mentioned at all - and hence no discussion of a distinction between the two, or if any could be drawn. There was, in addition, no definition of the boundary between research and "development", which is prohibited. For example, the parameters of the "quantities" were not delineated. Second, there were no provisions for verification of any sort. In 1972 the USSR was totally opposed to any consideration of on-site verification. In more recent years, once verification could be considered, the first set of problems would pose the greatest difficulty: distinguishing between legitimate "protective" or "defensive" biological research programs and those intended for offensive use.

Following the anthrax accident at a military BW facility in the USSR at Sverdlovsk in 1979, the US attempted to make use of the consultation provisions under Article 5 of the BWC. The US diplomatic effort was criticized for not having been handled well, but it is inconceivable that the USSR would have provided valid information under any circumstances, given the nature of the accident and what it would have disclosed. In 1984 the US declared the USSR in violation of the BWC but did not lodge a complaint with the United Nations Security Council, as it was entitled to do under Article 6 of the BWC, a procedure that could also have been followed in 1979. A Soviet veto of any such US initiative in the Security Council would have been likely in 1979 or 1984, but would at the same time have impugned Soviet compliance.

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[1] The history of Biological Weapons arms control negotiations, before and after the achievement of the Biological Weapons Convention, are documented in, among other sources,

- Jozef Goldblat, Vol. 4; CB Disarmament Negotiations, 1920-1970, in The Problem of Chemical and Biological Warfare, SIPRI, Stockholm International Peace Research Institute, Almquist and Wiksell, and Humanities Press, 1971.
- Robert W. Lambert and Jean E. Mayer, International Negotiations on the Biological-Weapons and Toxin Convention, United States Arms Control and Disarmament Agency, May 1975.
- Nicholas A. Sims, The Diplomacy of Biological Disarmament; Vicissitudes of a Treaty in Force, 1975-85, MacMillan Press, London, 1988.

Annual updates on the state of the negotiations appear frequently but intermittently in the United Nations Disarmament Yearbook, (vol. 19 being the 1994 Yearbook), and in the SIPRI Yearbook World Armaments and Disarmament which has been published annually since 1968/69.

The second review conference took place in 1986, following the transition to the Gorbachev administration in the USSR. There were two important outcomes. First it decided on four "Confidence Building Measures" (CBMs).[2] These were to be "politically binding", but not mandatory. They were:

(1) the declaration of all high containment facilities and of defense facilities: exchange data on high-security containment facilities (all BL-4 laboratories, and BL-3 ones at defense facilities), including providing data on their work programs.

(2) The declaration of unusual outbreaks of disease: exchange information on unusual outbreaks of diseases, (unusual in terms of the detection of a new, possibly unique disease, and/or a disease at a location where it has never before been observed).

(3) The encouragement of the publication of the results of research: encourage the open publication of results from bacteriological and biological research.

(4) The encouragement of international contacts between scientists: actively promote international contacts between biological researchers, including promotion of joint projects between them, directly related to the BWC.

In addition, to resolve the type of situation brought about by the unresolved allegations of the United States against the USSR, it was decided that, under Article 5, a consultative meeting would be promptly convened at the request of any signatory nation that asked for one in order to consider a specific presumptive violation. In April 1987 an ad hoc meeting of experts met and established the procedures for the information exchanges.[3] The first exchange was to be completed by October 15, 1987. Subsequently, submissions were to be provided each year. The third review conference, to take place in 1991, would decide whether to make any changes in the procedure.

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[2] For summaries of the first and second BWC Review Conference, see Raymond Zilinskas, "Biological Warfare and the Third World", Policy and the Life Sciences, 9:1 (August 1990), pp. 59-75. The discussion above follows his presentation.

See also Final Document, Second Review Conference of the Parties to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, BW/CONF. II/13, September 30, 1986.

[3] Ad Hoc Meeting of the Scientific and Technical Experts from States Parties to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, BW/CONF. II/EX/2, April 21, 1987.

When the third BWC conference was convened in September 1991 there had been several significant intervening developments:

- The Gulf War had just ended, and in it there had been the possibility of use of both biological and chemical weapons by Iraq. Moreover, Iraq had been a signatory of the BWC.
- For the above reason, as well as for others, there was greater interest in BW proliferation.
- The USSR was being extremely cooperative in strategic arms control negotiations, and for the first time, provisions for on-site inspection had been written into the Stockholm CBMs in 1986 and into the INF Treaty by the end of 1987.
- It was by then more or less clear that the Chemical Weapon Convention, then under negotiation, was going to have rigorous verification provisions, including on-site inspection.
- The record of submission of the voluntary declarations was poor. As it turned out, only 13 states submitted CBM declarations in 1987, 24 in 1988, 28 in 1989, 36 in 1990, 41 in 1991, and 35 in 1992. Many of these were no more than a single line stating compliance. It took five years before a third of the state parties to the BWC provided declarations.

All of these factors combined to produce a very substantial interest for stronger verification provisions in the BWC on the part of a substantial number of the state parties attending the review conference. Seeing both the obvious need for strengthening, and the opportunity provided by the changed international political circumstances, there had been a good deal of thinking and preparation by both governments and NGO's in advance of the Review Conference.[4]

The Third Review Conference first reaffirmed the four CBM's established in 1986. It then added three more: the declaration of national legislation related to the BTWC; the declaration of past activities in offensive/defensive biological research and development programs; and the declaration of human vaccine production facilities.[5] But, as the head of the US delegation to the Review Conference explained,

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[4] - Symposium on Improving Confidence building Measures for the BW Convention, National Defense Research Establishment, Umea, Sweden, May 1990.
- Erhard Geissler (ed.), Strengthening the Biological Weapons Convention by Confidence Building Measures, SIPRI Chemical and Biological Warfare Studies, No. 10, Oxford University Press, Oxford, 1990.
- "Proposals for the Third Review Conference of the Biological Weapons Convention", (Federation of American Scientists), Arms Control. 12:2 (September 1991), pp. 240-254.
- Jozef Goldblat and Thomas Bernauer, The Third Review of the Biological Weapons Convention: Issues and Proposals, Research Paper No. 9, UNIDIR, United Nations, New York, 1991.
- Collected Papers, Seminar on the Biological Weapons Convention, Noordwijk, the Netherlands, Ministry of Foreign Affairs, The Netherlands, February 1991.
- S.J. Lundin (ed.), Views on Possible Verification Measures for the Biological Weapons Convention, SIPRI Chemical and Biological Warfare Studies, No. 12, Oxford University Press, Oxford, 1991.

> "The issue of verification became the single most contentious question at the 1991 BWC Review Conference. The majority of states parties argued that they should incorporate verification measures into the BWC even if those measures were not completely effective since such measures would contribute to deterring BW proliferation. The United States, however, argued that the BWC was not verifiable and it had not identified a way to make it so. In simplistic terms the argument was between those who contended that 'some verification was better than none' and the United States argued that 'bad verification was worse than none.'"[6]

The irony was very great. The United States had always been the major proponent of verification procedures in US-USSR arms control negotiations since the late 1950's. The succeeding US Ambassador to the conferences which followed explained the position of the Bush administration in greater detail. While noting that "Adequate and effective verification is an essential element of all arms limitation and disarmament agreements," he continued,

> "Many governments, especially in the West. . . wanted to amend the BWC by adding more restrictive, intrusive measures. . . the United States delegation opposed these measures. However, the United States did agree to formation of a working group of experts whose mission is to evaluate any verification measures proposed by States Parties from a scientific and technical standpoint.".
>
> "Verification measures are included as part of an arms control agreement to enhance the national capability of parties to monitor compliance and to detect violations in a timely fashion. In addition, verification measures are included to deter violations of an arms control agreement. Of course, judgments about compliance are a national prerogative, and each party must rely on the information it has available to assess the compliance of the other parties.
>
> "The United States draws a clear distinction between confidence building and verification. Confidence building measures provide participants with access to information that encourages a climate of openness and transparency. They also allow participants to demonstrate how their activities should not be considered threatening to others."
>
> "Effective verification measures, singly or in combination, should:
>
> - Provide confidence that the States Parties are in compliance with treaty provisions;
> - Deter violation of treaty provisions by significantly increasing the risk of detection and thereby raising the costs of cheating;
> - Enable the States Parties, individually or collectively, to detect a violation in a timely fashion before it poses a military risk and/or places a State Party in a position where it is too late or too difficult to take countermeasures.
>
> "Given this understanding of verification, our own analyses indicate that the BWC cannot be made more effective by adding verification measures known to us. The small size and complex structure of microorganisms, and the dual-purpose nature of many items used in biological

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[5] Third Review Conference of the Parties to the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, BW/CONF. III/22 Add. 2, September 27, 1971.

[6] Michael Moodie, "Bolstering Compliance with the Biological Weapons Convention; Prospects for the Special Conference", Chemical Weapons Convention Bulletin, No. 25 (September 1994), pp. 1-3.

> production, make verification of a ban on biological weapons problematic, to say the least. Our concerns about the verifiability of the BWC are the primary reason the United States opposed the proposals for specific verification regimes made at the September 1991 review conference. But it should also be noted that the United States opposes any measure that would limit our ability to pursue a biological defense program or unduly burden American industry."[7]

Amb. Lacey reiterated that "It is. . . our view that any proposed regime must not have an unacceptable impact on United States industry. . . CBM's should not pose an undue burden on . . . workers or harm the competitiveness of US companies."

A "verification Protocol" had actually been proposed at the Review Conference and was supported among others by Sweden, the Netherlands, France, Germany and Russia.[8] All - including Russia - favored some sort of on-site or challenge inspections, and made specific proposals regarding various degrees of frequency and intrusiveness. All explicitly understood that an inspection regime would not produce absolute certainty of the absence of violation, but all felt that it was impossible to conceive of circumstances in which less information could be better than having more information. In the mid-1980's with no verification possible, the Reagan administration, in addition to having provided for a 500-plus percent increase in funding for BW research in six years, felt that the utility of the treaty was limited and placed little emphasis on it.[9] In 1991-92, with on-site verification conceivable, albeit unquestionably difficult, the Bush administration decided in advance that it could not work, that it could not produce a level of absolute confidence, and therefore opposed it entirely. It is not even clear if this was the primary policy determinant, or if the other two stated concerns - the protection of proprietary information of US commercial biotechnology and pharmaceutical firms, and the safeguarding of US defensive research from formal international monitoring - were the driving policy determinants, or if the administration had seriously attempted to a draw a balance between them. Whether a verification protocol was achievable in 1991-92 on a par with the Chemical Weapons Convention is unknown, but the US opposition was essentially responsible for the stretched out process that began in 1992 and will extend through 1996. Ironically, just halfway through that period, the US government's position changed entirely, and favored what it had opposed in 1991-92.

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[7] Dr. Edward J. Lacey, Address to the Biological and Biotechnology Section of the Pharmaceutical Manufacturers Association, September 29, 1992.

[8] "Implementation of the Proposals for a Verification Protocol to the Biological Weapons Convention", (Federation of American Scientists), Arms Control, 12:2 (September 1991), pp. 255-278.

[9] This attitude was expressed in papers such as Douglas J. Feith's "Biological Weapons and the Limits of Arms Control", The National Interest, (Winter 1986/7), pp. 80-84, and Joseph Finder, "Biological Warfare, Genetic Engineering, and the Treaty That Failed", The Washington Quarterly 9:2 (Spring 1986), pp. 5-14.

See also Lynn M. Hansen, "Arms Control in Vitro", Disarmament (United Nations) 10:1 (winter 1986/7), pp. 59-65. The same issue has articles on the BWC Review Conference by Winfried Lang, Jorge Pando, and Mikhail Kokeiev.

The US opposition resulted in the creation of an Ad Hoc Group of Governmental Experts which subsequently came to be known as the VEREX exercise, with membership drawn from states parties to the BWC. It was tasked with adopting a consensus report on additional verification measures before the end of 1993, which would then be considered by BWC members. The charge to the expert group was to

> ". . . identify measures which would determine whether a State Party is developing, producing, stockpiling, acquiring or retaining microbial or other biological agents or toxins, of types and in quantities that have no justification for prophylactic, protective or peaceful purposes; and whether a state party is developing, producing, stockpiling, acquiring or retaining weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict."

To do this they were directed to use the following criteria to guide the examination of potential verification measures:

1. their strengths and weaknesses based on, but not limited to, the amount and quality of information they provide, and fail to provide;
2. their ability to differentiate between prohibited and permitted activities;
3. their ability to resolve ambiguities about compliance;
4. their technology, material, manpower and equipment requirements;
5. their financial, legal, safety and organizational implications;
6. their impact on scientific research, scientific cooperation, industrial development and other permitted activities; and their implications for the confidentiality of commercial proprietary information.

The measures could be examined singly or in combination. When the experts had completed their work, and their report circulated to BWC States Parties, if a majority of them requested a Special Conference to consider it and to decide on what next to do, that would take place. There had never been a Special Conference held under the treaty before, but it would obviate having to wait for the next Review Conference, which was not scheduled until 1996, to decide on further steps.

The US administration's guidance to the US delegation to the first VEREX meeting in March-April 1992 was described in a report by the US Government Accounting Office:

> "The US strategy for the first meeting of the Ad Hoc Group of Governmental Experts called for the US delegation to be open to constructive suggestions, but to oppose any ineffective verification provision and any measures that would limit the US government's ability to pursue its biological defense programs, and impair the US biotechnology industry's competitive edge now held in the world. The US delegation was to explain to the other delegations the nature, diversity, and complexity of biological research, including its dual-use nature, the small size of some equipment, and its widespread existence. Furthermore, the delegation was to explain that because of legitimate commercial and defense activities requiring biological items, evidence of an offensive BW program is therefore not easily identifiable. The United States did not make any verification proposal during the meeting."[10]

That guidance and US administration policy changed in 1993.

The Ad Hoc Group agreed to examine 21 potential verification measures under the three broad areas of a BW program: development, acquisition or production, and stockpiling or retention. They did this in three subsequent meetings: the first to analyze the technologies that would be associated with proposed measures on the list, the second to evaluate proposed measures according to the agreed criteria, and the last to compile a final report for BWC members. The 18-month VEREX exercise would evaluate the 21 measures singly and in combinations in an attempt to find the best possible combination within the constraints of the cost to carry them out and the problems of commercial industries.[11] The final report was to be an analysis which would compare the various measures, and not a draft verification regime. The measures were divided into two categories, off-site and on-site measures. Off-site measures included remote sensing and various types of information monitoring, primarily by various kinds of instrumentation. The 21 measures were the following:[12]

Off-site measures:
a. Information monitoring
- Publication surveillance
- Legislation surveillance
- Data on transfers and transfers requests
- Multilateral information sharing
- Exchange visits

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[10] Arms Control: US and International Efforts to Ban Biological Weapons, GAO/NSIAD-93-113, December 1992, p. 19.

[11] As indicated the first VEREX meeting took place on 3/30/92 to 4/10/92, with 53 participants; the second from 11/23/92 to 12/4/92, with 46 participants; the third from 5/24/93 to 6/4/93, with 42 participants; and the fourth and final session on September 13 to 24, 1993, with 41 participants.

[12] Report, including Final Report, Ad Hoc Group of Governmental Experts to Identify and Examine Potential Verification Measures from a Scientific and Technical Standpoint, BWC/CONF> III/VEREX 9, Geneva, September 1993.

- b. Data exchange
  - Declarations (including notification)
- c. Remote sensing
  - Satellite surveillance
  - Aircraft surveillance
  - Ground-based surveillance
- d. Inspections
  - Sampling and identification
  - Observation
  - Auditing

On-site measures:

- a. International arrangements
- b. Inspections
  - Interviewing
  - Visual inspection
  - Identification of key equipment
  - Auditing
  - Sampling and identification
  - Medical examination
- c. Continuous monitoring
  - Instruments
  - Personnel

Measures in combination:

The following five combinations were examined as examples to illustrate the evaluation of enhanced capabilities and limitations of measures in combination:

- Declarations/Multilateral information sharing/Satellite surveillance/Visual inspection
- Information monitoring (surveillance of publications/surveillance of legislation/data on transfers, transfer requests and production/multilateral information-sharing/exchange visits)
- On-site inspection (interviewing/visual inspections; identifications of key equipment/auditing/sampling and identification)
- Declarations/Multilateral information-sharing/On-site visual inspection
- Declarations/information monitoring

The VEREX final report was not particularly a blaze of enthusiasm. It noted ". . . that capabilities and limitations existed for each measure", and that ". . . reliance could not be placed on any single measure by itself to determine whether a State Party is developing, producing, stockpiling, or retaining. . ." It noted that the group had "most frequently identified for application" a group of Declarations, as well as the entire subset of on-site inspections, and concluded,

> "Based on the examination and evaluation of the measures described above against the criteria given in the mandate, the Group considered, from the scientific and technical standpoint, that some of the potential verification measures would contribute to strengthening the effectiveness and improve the implementation of the Convention, also recognizing that appropriate and

effective verification could reinforce the Convention."[13]

The required majority of BWC States Parties did request a Special Conference, which led to another cycle of conferences. The Special Conference met in September 1994, received the VEREX report favorably, and established a new Ad Hoc Group that would now "examine appropriate measures, including verification measures, and draft proposals to be included, as appropriate, in a legally binding instrument." The Ad Hoc Group then met twice in 1995, will have a third meeting, and then two sessions in 1996 to be coordinated with the Fourth Review Conference of the BWC, which will presumably codify a decision.[14]

During this drawn-out five year period of conferences of experts and negotiations there was one other intervening event with important arms control significance. In June 1993 the Australia Group, a group of nations that in the past had drawn up and agreed to a target list of items to aid in controlling the exports of materials that could lead to the production of chemical weapons, did the same for biological agents and the manufacturing equipment that could be used to produce BW.[15] The 26 members of the group agree to follow the same export restrictions. Notably, Iran has expended a good deal of diplomatic effort, unsuccessfully, to have the Australia Group abolished. Their meeting took place jointly with the European Commission, and again evolved from an earlier policy decision, in 1990, that the group would extend its efforts from the chemical weapons area to also develop export control guidelines in the biological area.

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[13] ibid.

[14] The Special Conference took place on September 19 to 30, 1994, with a preceding Preparatory Committee meeting on April 11-15, 1994. The 1995 Ad Hoc Group meetings were on January 4-6, 1995 and July 10-21, 1995, and the last 1995 session will be on November 27 to December 8, 1995.

[15] Australia Group Meeting: Fact Sheet, US Arms Control and Disarmament Agency, July 28, 1993, 2 pages, and Australia Group, Export Controls on Materials Used in the Manufacture of Chemical and Biological Weapons; Control List of Dual-Use Biological Equipment, List of Biological Agents for Export Control Core List, Control List of Plant Pathogens, Control List of Animal Pathogens. Fact Sheet, US Arms Control and Disarmament Agency, October 25, 1993.

The list included 7 categories of equipment:

- BL-3 and BL-4 containment facilities
- Fermenters
- Centrifugal separators
- Cross flow filtration equipment
- Aerosol inhalation chambers
- Freeze-drying equipment
- Equipment to be included inside BL-3 or BL-4 containment

Each of these categories of equipment was defined by specific technical parameters.

Where has the process of strengthening the BWC by providing additional verification capability reached? At the September 1994 Special Conference several nations, Iran above all, wanted to see nothing further take place. However by September 1994 the United States was interested in seeing that a series of "transparency measures" similar to those that the United States, Russia, and the UK had agreed on in the trilateral process in September 1992, be extended on an international basis to all States Parties of the BWC. That included mandatory data exchanges, or declarations, and mandatory on-site visits. Both aspects were essential; whatever was decided on must be mandatory, and there had to be some on-site inspection capability. The US also hoped that the new Ad Hoc Group established by the Special Conference would function as a drafting group, to prepare a Protocol to the BWC that would be ready in time for consideration at the Fourth Review Conference in 1996.

The purpose of the mandatory declarations would be to provide a database on the facilities that were of the greatest potential danger to the BWC, the most convertible, and the easiest to disguise: all facilities with high containment, all that used listed organisms, and all national biological defense programs.[16] Over a period of years such declarations would presumably provide a profile of "a national pattern of activity." If that profile changed it could provide reason for an on-site visit. Such visits would have to take place on relatively short notice, and they would be to any declared or undeclared site, or to a site of alleged use of BW. The requirement for a greater number of declarations and for mandatory ones meant that the question of an international directorate would have to be resolved. The most likely solution would be an addition to and colocation with the OPCW, the organization responsible for verification of the Chemical Weapons Convention (in full, the Provisional Technical Secretariat of the Organization for the Prohibition of Chemical Weapons). Finally, the existing BWC would be left intact so as not to run the risk of loosing any current States Parties, and in order that a new Protocol be legally binding it would have to undergo a separate ratification process. As there were already signatories to the BWC who had not yet ratified it, it was likely that many in that group would not ratify the new protocol, or even sign it.

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[16] See the following very useful papers on recent efforts and proposals to strengthen the BWC:

- Graham S. Pearson, "Forging an Effective Biological Weapons Regime", Arms Control Today, 24:5 (June 1994), pp. 14-17.
- Graham S. Pearson, "Strengthening the Biological and Toxin Convention: The Outcome of the Special Conference", Chemical Weapons Convention Bulletin, Issue No. 26 (December 1994), pp. 1, 3-6.
- Jonathan B. Tucker, "Strengthening the Biological Weapons Convention", Arms Control Today, 25:3 (April 1995), pp. 9-12.
- Michael Moodie, Sept. 1994, op. cit.
- Graham S. Pearson, "Improving the Biological Weapons Convention", Proceedings of the First Moscow Conference on Chemical and Biological Disarmament, Demilitarization and Conversion, Chemical and Biological Arms Control Institute, 1993; see also brief papers by Edward Lacey, H. Mash'hadi, and Nikolai Pietkov.
- Edward J. Lacey, "Tackling the Biological Weapons Threat: The Next Proliferation Challenge", The Washington Quarterly, 17:4 (Autumn 1994), pp. 46-53.
- Susan Wright, "Prospects for Biological Disarmament in the 1990s," Transnational Law and Contemporary Problems 2:2 (Fall 1992): 453-492.

The July meeting of the Ad Hoc Group in fact divided its work program into four areas, the first two of which appear to be somewhat redundant and are both an outgrowth of the VEREX process:

- Measures to promote compliance: declarations, on-site measures, including short notice and challenge inspections, etc;
- Other confidence-building and transparency measures;
- Lists of agents and toxins, definitions, criteria;
- "Article 10 issues".

The last, under pressure from Iran and several other participants, refers to increasing technology transfers to developing nation member states.

Problems and Possibilities of Verification

The last half-dozen years have provided the experience with the USSR/Russia and Iraq, in which partial and limited degrees of inspection have not been sufficient to wholly determine the past or present status of either nation's BW program. It is crucial to understand the nature of past programs in order to establish a baseline for subsequent credibility and control, and neither nation was willing to disclose the details of their past programs. As one of the UNSCOM inspectors commented regarding Iraq, "They only tell us what we find out about; if there is a chance to hide anything, deceive something, they do so. The biological area was the one most lacking in cooperation, the one that they engaged in with the greatest reluctance." Both nations were determined to hide their activities, and both were and are controlled societies to a major degree. Access to Russian facilities is still quite limited.

The verification problem is simply the ability to find and then to distinguish prohibited from permitted activity, to distinguish offensive from defensive research programs. In BW this is complicated by the fact that the facilities - at least in theory - need not be very large, although all the national facilities identified to date have been sizable, and the equipment is for the most part dual purpose.

What would one look for? The Director of Biological Research at a French military laboratory listed the following in 1992 as "indicators of strategic BW development":

> ". . . large scale production of an agent, the existence of certain storage facilities, the use of certain equipment such as fermenters and freeze drying equipment, and the safety protection being provided personnel."[1]

When US satellite intelligence photo interpreters in the mid-1970s identified tall incinerator stacks, large cold storage facilities, animal pens, sentries and double barbed wire fences in a Soviet military compound in Sverdlovsk they suspected it of being a BW laboratory - which it was. Both lists of characteristics however are at the high end of the indicator spectrum, and of course the use of fermenters alone would not be indicative; all would depend on what was being grown in them. In addition, more recent technology could reduce the need for large stockpiles that were previously held in readily recognizable storage facilities, depending on the procedures that a nation chose to implement. Raymond Zilinskas wrote that

> ". . . verifying that no BW-related work is taking place in a given nation's P-4 (BL-4) research

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[1] GAO, 1992, op. cit., p. 21.

> laboratories is probably the single best measure indicating that the nation in question is indeed not involved with BW."[2]

However, it appears that Iraq had no BL-4 facility.

The Russian Foreign Intelligence Service produced a remarkable indicator list in 1993, saying,

> "The development, production, stockpiling, and possible use of biological weapons may . . . be identified on the basis of the following specific indications:
>
> - the existence of programs for training troops, special subunits or intelligence and sabotage groups, for operations involving the use of biological weapons;
> - the presence or purposeful search for highly qualified specialists in immunology, biochemistry, bioengineering, and related fields, who have experience in the development of biological weapons and means of protection;
> - the building of laboratories with enhanced security [according to international classification P-3 (BL-3) or P-4 (BL-4)];
> - the development of secret research programs and secret special and military facilities of biomedical orientation;
> - large-scale production of vaccines (against especially dangerous infections) and the existence of stocks of these vaccines which exceed real peacetime requirements;
> - creation of a production base, specifically of bioreactors and fermenters with a capacity of more than 50 liters or a total capacity of more than 200 liters;
> - outbreaks of especially dangerous infectious diseases not typical of specific regions;
> - the purchase of starting biomaterials and equipment for the production of biological weapons, as well as delivery systems for them;
> - activity related to microorganisms and toxins which cannot be explained by civilian requirements, activity involving agents of especially dangerous infections not endemic to a given area;
> - the existence of biotechnological equipment and conduct of work to create vectors of various diseases in people, animals, or plants, as well as composite media for culturing them;
> - the existence of equipment for microencapsulation of live microorganisms;
> - the existence of equipment for studying the behavior of biological aerosols in the environment."[3]

Not the least interesting aspect of this list is that it would always have served as an indicator of the former Soviet BW program. But the list is even more "superindicative" than the group of items provided by the French official. It of course identifies the maximum of everything in a large and ambitious national program, even including a potential disease outbreak due to a BW installation accident, such as actually took place in the former USSR in 1979.

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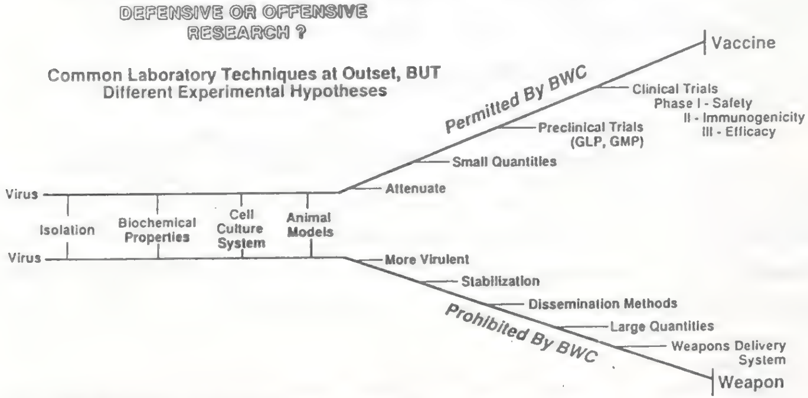
[2] Raymond Zilinskas, "Verification of the Biological Weapons Convention", Chapter 7 in Erhard Geissler (ed.), Biological and Toxin Weapons Today, SIPRI, Stockholm International Peace Research Institute, Oxford University Press, Oxford, 1986, pp. 85-107.

[3] "Proliferation Issues: A New Challenge After the Cold War: Proliferation of Weapons of Mass Destruction", Russian Federation Foreign Intelligence Service Report, March 3, 1993, JPRS-TND-93-007, pp. 15-16.

The former director of USAMRIID, Col. David Huxsoll, presented a scheme in 1989 testimony to Congress which attempted to set out the differences between offensive and defensive research, as well as between the development of vaccines and other defenses and biological weapons.

> "From the outset, defensive research is based on different postulates and hypotheses than is research directed toward offensive ends, and the rationales for data collection and analysis are different.
>
> "At the basic research level, the laboratory techniques used would be very similar, but the objectives are markedly different. Beyond the basic research level, there is a marked divergence in the type of work that would be done.
>
> "If a vaccine were to be produced, one that would pursue ways of crippling, weaken, or lessening the virulence of the agent in question so that it could be used in humans without fear of inducing disease. In fact, it may be completely inactivated, a killed vaccine.
>
> "A vaccine would be produced under the stringent guidelines of the Food and Drug Administration regulations and would have to receive FDA approval before use. This type of work is permitted by the Biological Weapons Convention."
>
> "If, however, the goal were to create a weapons, the opposite objectives would be pursued. Efforts to enhance virulence or toxicity and to produce enormous quantities of agent far larger than those required for vaccine production would be undertaken. In addition, the issues of stability, dissemination, and weapons delivery systems would have to be addressed. These activities are clearly prohibited by the Biological Weapons Convention."[4]



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[4] Global Spread of Chemical and Biological Weapons, Hearings, Committee on Governmental Affairs, US Senate, 101st Congress, 1st Session, May 1989; testimony of Dr. David Huxsoll, pp. 199 to 203.

In questioning by the Senate Committee staff Dr. Huxsoll appeared however to also rely on the presence of BL-4 facilities and "program intent" as two key discriminanda. "Intent" is of course inferred by an outside observer, and that key concept will be returned to below in a discussion on differentiating research programs.

His argument was seconded by a US Army Medical Intelligence officer who similarly identified four key factors: the amount of agent produced, the attenuation of the organisms used for vaccine production, process difference between vaccine and weapons production, and the openness of a defensive program.[5] This analysis was carried further in a set of tables prepared by the Armed Forces Medical Intelligence Center in 1993 entitled "Signatures for Biological Warfare Facilities."[6] It divided indicators into five categories:

- funding and personnel,
- facility design, equipment, and security,
- technical considerations,
- safety,
- process flow.

Under each of these categories it listed a series of common - or quite dissimilar - characteristics in a "BW facility" and in a "legitimate facility" for example, the location of refrigerated bunkers, facility security, the nature of waste treatment, location of air filters, air pressure gradients, etc. Forty such characteristics were evaluated and appeared to provide quite a good differentiation between the BW facility and the presumptive pharmaceutical or other commercial site. (see tables, below)

Have there been any post-WWII BW inspection regimes or trial inspection exercises, and if so, what has been learned from them? There have been several, and cumulatively, they in fact provide extremely useful information.

Under the terms of the Brussels Treaty and Paris agreements that established the Western European Union in 1954 a WEU Armaments Control Agency (ACA) was established. The terms of the treaty were to remain in effect at least until the year 2005, and under them the Federal Republic of Germany agreed never to manufacture chemical, biological, or nuclear weapons. The ACA was to monitor the FRG's compliance with that provision via non-production controls. It was to do that by examining "statistical and budgetary information," and by "test checks, visits and inspections at production plants, depots, and

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[5] ibid., Dr. Barry Erlick, pp. 33-40.

[6] Signatures for Biological Warfare Facilities, Armed Forces Medical Intelligence Center, 11 pages, (unclassified).

Signatures for Biological Warfare Facilities

(Armed Forces Medical Intelligence Center)

1. Funding and Personnel
2. Facility Design, Equipment, and Security
3. Technical Considerations
4. Safety
5. Process Flow

1. Funding and Personnel

BW FACILITY	LEGITIMATE FACILITY
1. Military funding	1. Private enterprise or nonmilitary
2. High salary	2. Salary within normal limits
3. Funding exceeds product/research output	3. Average or underfunded for expected output
4. Scientists/technician ratio high	4. Average ratio
5. Limited Ethnic diversity	5. Integrated work staff
6. Elite work force/foreign trained	6. Local trained work force
7. Foreign language competency	7. Limited foreign language capability
8. High ratio of military to civilian	8. Military personnel unlikely

2. Technical Considerations

BW FACILITY	LEGITIMATE FACILITY
1. Pathogenic or toxic strains	1. Non-pathogenic or non-toxic strains
2. Test aimed at killing animals	2. Test aimed at protecting animals
3. Facilities for large animals such as monkeys	3. Facilities for smaller animals, specific inbred strains
4. Negative air flow	4. Positive air flow
5. No commercial products	5. Commercial products
6. Weapons filing equipment	6. Bottle filling equipment

3. Facilities, Security, and Equipment

BW FACILITY	LEGITIMATE FACILITY
1. Access control: High walls, guard towers, motion detectors, video cameras, elite security force, badges and clearances	1. Average security, badges at most
2. Transportation provided	2. Public/private transport
3. Quarantine facilities on compound	3. No quarantine
4. Foreign travel restricted, highly available	4. Unrestricted but not readily available
5. Refrigerated bunkers secure area	5. Cold rooms in facility
6. Advanced software, external data base access ADP security high foreign access	6. Open information except for proprietary information
7. Static aerosol test chambers	7. No aerosol test chambers
8. Military with weapons expertise	8. No need
9. Rail or heavy truck required for weapons filling facility	9. Only light truck transportation

4. Safety

BW FACILITY	LEGITIMATE FACILITY
1. Physical barriers to prevent animal to animal and animal to human transmission	1. Physical barriers designed to prevent animal to animal and human to animal transmission
2. HEPA filters present, exhaust	2. HEPA filters possible, intake
3. Dedicated biosafety personnel	3. May or may not be present
4. Infectious and toxic agent trained medical staff	4. Dedicated highly trained staff not likely
5. Decontamination equipment and showers	5. Not needed on large scale
6. Large capacity pass through autoclaves	6. Small bench top autoclaves
7. Dedicated waste treatment	7. Waste treatment common with local facilities
8. Special sterilization of waste	8. May or may not exist
9. Test animals sterilized before final disposal	9. Animals may not need to be sterilized before final disposal

5. Process Flow

BW FACILITY	LEGITIMATE FACILITY
1. Raw material consumption doesn't equal output	1. Raw material consumption relates to output
2. Large volume fermenters (greater than 500 liters) cell cultures (1000's of culture flasks/roller bottles) embryonated eggs (100's thousands)	2. Large or small scale fermentation but cell culture and eggs in smaller volume
3. Air pressure gradients keep microbes in vessel	3. Air pressure gradients keep contaminants out of vessels
4. Finished product - wet stored at low temperature in sealed (often double packaging) containers - not readily identifiable	4. Labelled by product, batch number, date, etc.
5. Milling equipment operated in biohazard protective suits	5. Milling equipment is not operated in biohazard areas
6. Storage - low temperature, high security, bunkers with biocontainment	6. Storage in temperature controlled environment, clean warehouse conditions
7. Munitions - special filling buildings and/or explosives handling facilities	7. Non-issue

forces."[7] In 1959 a list of biological products, (agents) to be controlled was approved, and although chemical production sites were visited in subsequent years, formally, biological ones were not, ". . . due to the absence of any legal guarantees to protect private interests," that is, the problem of commercial secrecy. However "technical information visits" were made to biological facilities in the FRG and in other WEU countries. In addition, an economic accounting procedure was established. A group of WEU military and biological experts met in 1959 and for each of the BW agents on the control list established a :"threshold" amount, corresponding to the amount reckoned to be needed in order to obtain "direct military effect" over an area of one square kilometer. The WEU/ACA then asked the FRG to provide the following information each year:

1. The names of West German production plants[8] capable of producing pathogenic organisms or toxins.
2. The biological products on the Agency's list that were produced within the FRG during the previous year.
3. The names of the plants which produced or processed these products.
4. The names of plants which could have produced them but did not.
5. The quantities produced by each plant, and the quantities consumed for civilian purposes.
6. The quantities of civilian end-items made from these products during the previous year, together with production estimates for the next year.
7. The quantities of the products in stock at each plant.

The information was supplied by the FRG each year.

The first "east-west" BW trial inspection exercise was carried out in the mid-1960's by the Pugwash BW study group. It visited four laboratories; in Stockholm, Vienna, Prague, and Copenhagen. This was then greatly expanded upon in 1968-1969 in a trial inspection exercise carried out by SIPRI, the Stockholm International Peace Research Institute, as part of its major study on chemical and biological weapons arms control.[9] 22 laboratories or production facilities were approached, of which 14 accepted site visits: 8 research laboratories, 3 of them in Warsaw Treaty Organization countries, and 6 production establishments, none in the WTO, but one of them in Eastern Europe (Yugoslavia). The 22 facilities solicited were not however selected at random, but depended on personal contacts known to the research team. 25 scientists from Western, Eastern, and neutral states were involved in the teams that made the inspection visits. A reasonably elaborate protocol and questionnaire was developed for the site visits, whose purpose was defined as locating sufficient BW agent production to be deemed to be "militarily relevant". That was defined as 10 kilograms (around 20-25 pounds) of microbial paste or spores, of a half kg (one pound) of botulinum toxin. It should be noted that at the present time an inspection would be looking for orders of magnitude larger quantities. The visits however were not on short warning. It is also understood that the 14 facilities that participated in the exercise did so with the knowledge of their relevant national authorities.

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[7] "The CB Weapons Controls of the Western European Union Armaments Control Agency", Appendix 3 in The Prevention of CBW, Vol. 5 in The Problem of Chemical and Biological Warfare, SIPRI, Stockholm International Peace Research Institute, Almquist and Wiksell and Humanities Press, 1971.

[8] The ACA defined "production plants" as "every unit suitable for producing in such amounts as are covered by the definition of a biological weapon [i.e., the threshold amounts that were established for each BW agent] those biological products which are to be controlled, regardless of its ownership, legal position, size and number of workers employed." The thresholds, however, were established in an extremely inadequate manner.

Following all the visits the protocol records were distributed to some 70 professional who were asked to judge what the chances would have been of finding the defined militarily relevant quantity. Fifty replied, with a consensus that there would have been about a 50:50 chance of doing so. The study concluded

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[9] "The Problems of Inspection Concerned with BW Agents", Chapter 2, in Technical Aspects of Early Warning and Verification, Vol. 6 in The Problem of Chemical and Biological Warfare, SIPRI, Stockholm International Peace Research Institute, Almquist and Wiksell and Humanities Press, 1975, pp. 39 to 60, 89 to 103.

See also Appendix 2, "Verification of CB Disarmament", in Vol. 5, The Prevention of CBW, op. cit., 1971, pp. 137 to 163.

The institutions or laboratories that accepted visits in this exercise were the following:

Research laboratories:

1. The Medical Research Council Group for Bacteriological Bioengineering, Stockholm.
2. The Institute of Microbiology of the Czechoslovak Academy of Sciences, Prague.
3. The Institute of Virology for the Czechoslovak Academy of Sciences, Bratislava.
4. Bundesforschungsanstalt fur Viruskrankheiten der Tiere, Tubingen, West Germany.
5. The Lister Institute of Preventative Medicine, London.
6. The State Institute of Hygiene, Warsaw.
7. The University Institute of Microbiology, Copenhagen.
8. The Institute of Hygiene, Graz, Austria.

Production establishments:

9. The Institute of Immunology, Zagreb, Yugoslavia.
10. The Lister Institute of Preventative Medicine, Elstree Laboratories, Elstree, England.
11. Wellcome Research Laboratories, Beckenham, Kent, England.
12. Institut Merieux, Lyon, France.
13. LEO Pharmaceutical Products, Copenhagen.
14. Aktiebolaget ASTRA, Sodertalje, Sweden.

> ". . . that a substantial measure of on-site verification would be possible provided certain conditions were fulfilled: documentation, free access to all facilities and personnel, the possibility of visits at short notice or of permanent inspection by resident inspectors or by exchange scientists cooperating with them."

A crucial assumption was that there was no falsification of production records at the production sites. That was perhaps a weak link in the exercise, otherwise it is interesting to note the similarity in the three basic conditions noted in the conclusion and the ones that would be assumed as necessary today.

In the 1990's two circumstances gave rise to a substantial group on BW inspections, some as national exercises, and some on an international and official level:

- the US-Russia-UK "Trilateral" process led to US-UK inspection visits to Russian facilities, and to Russian inspections of facilities in the US and UK;
- and as part of the VEREX process three western governments, the UK, the Netherlands, and Canada, ran trial inspections of commercial facilities in their respective countries.

There had in fact been Soviet visits to US military BW sites in previous years. Soviet government officials at the ministerial level had visited Fort Detrick in 1972 at US government invitation, as the US was interested in demonstrating the conversion of the site. Soviet officials again visited Fort Detrick - now USAMRIID - in 1988. US and Soviet delegations also visited each other's BW facilities in 1991, before the trilateral series of exchange site visits began. In addition representatives of Western pharmaceutical firms - from the US, UK, Austria, France, and Finland - as well as ones from Japan, Taiwan, and South Korea have been visiting Russian microbiological research institutes that were formerly affiliated with the Soviet Biopreparat organization to explore the feasibility of establishing joint venture commercial partnerships. When Russian teams have visited US facilities they have shown themselves to be highly meticulous inspectors; they knew what to look for, what might be hidden, and how it would be hidden, and at times used their own former BW program as a model for searches.[10]

In the course of the VEREX process, the Netherlands and Canada carried out a two-day trial inspection at a large vaccine production facility. Its purpose was to evaluate potential BW verification measures that had been identified by VEREX. It concluded that "the combining of measures would be essential to effective on-site inspection. During the trial inspection, issues relating to commercial confidentiality did not stand in the way of effective conduct of the inspection. Some sensitivities were noted, but solutions were at hand."[11] In particular, "Removal of live samples from the site would have been of great concern to the company, but removal of inactivated samples was not perceived to be a problem."

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[10] A Soviet team on a December 1991 US site visit was composed of members of the Soviet Ministry of Defense, Ministry of Foreign Affairs, and their biotechnology industry.

Also in conjunction with VEREX the UK carried out four practice inspections of plants in the biotechnology, pharmaceutical, and vaccine industries. The UK inspections were particularly focussed on issues of the compatibility of verification procedures in large multipurpose facilities capable of working with pathogens and the requirements of commercial confidentiality. The UK reports concluded

> "In-depth inspections are practicable: auditing, interviews and visual inspection of key equipment are all essential and mutually reinforcing. Any measure on its own is of little or no value.
>
> "Provided the sites being inspected make preparations and use managed access, the risks to commercially sensitive information can be reduced. On many occasions the amount of access that can be granted without unduly risking proprietary data can be extensive.
>
> "The standards of evidence for an effective inspection are high. This is a qualitative problem as unambiguous evidence of non-compliance is difficult to acquire, but indicators of such activity can be identified. Given the potential dual-use nature of biological agents and much related equipment, inspection teams need evidence from all aspects of the site under investigation if they are to form a judgment on its compliance. The main burden on industry is largely one of diversion of management time to hosting the inspection; there should be no need to disrupt plant operations or enter sterile area provided alternative means can be found to satisfy inspector concerns."
>
> * * * *
>
> "The IT [inspection team] was able to gather sufficient information to do its job effectively without compromising commercial confidentiality or Intellectual Property rights. It was possible for the HT [Facility or "Home" Team] to protect such information; for example, the deletion of critical data from the facility's Genetic Manipulation Safety Committee submissions to the national regulatory body before revealing the documents to the inspection team. There may however be different problems in a production plant and this will be addressed in future practice inspections, but it is encouraging to note that it is possible to conduct an intrusive inspection at an R&D and pilot plant facility without unacceptable compromise of commercial confidentiality. That an inspection can be carried out at an R&D plant is in itself highly significant.
>
> "This practice inspection demonstrated the feasibility of on-site inspections. Furthermore, it is clear that they are worthwhile and can be conducted in Western countries without too much disruption to activities. Given the nature of health, safety, environmental, and other regulatory provisions that govern the pharmaceutical and biotechnology industries in the West,

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[11] The Netherlands-Canada; Bilateral Trial Inspection in a Large Vaccine Production Facility; A Contribution to the Evaluation of Potential Verification Measures, BWC/CONF. III/VEREX/WP. 112, May 24, 1993, 19 pages.

demonstrating compliance with Article 1 of the BWC is comparatively straightforward."[12] Finally, the Federation of American Scientists carried out an inspection exercise in the United States with the cooperation of a commercial pharmaceutical plant.[13] Undoubtedly of great value to any international BW inspection agency or regime would be the verification protocols established by UNSCOM for its site visits to biological facilities in Iraq. These, and the experience gained from them, as well as from the series of trilateral site visits, would all undoubtedly be transferred to any new international BW agency.[14]

The British, Canadian, Dutch and US inspection exercises were all informally criticized by representatives of the US pharmaceutical manufacturers association as having been too "tame", and captive, and not as severe as they would have to face from international inspectors. They submitted a study to the US Arms Control and Disarmament Agency before the July 1995 meeting of the Ad Hoc Group, essentially arguing that they wanted no on-site inspections of their facilities. US government officials feel that the industry simply does not want to be inconvenienced in any way, and uses the potential compromise of commercially confidential information however, as a more palatable and serious-sounding argument to put forward. Unfortunately, it is the earlier US government statements of 1992 that have provided the industry with a large degree of the leverage of that argument.

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[12] - United Kingdom BTWC Practice Compliance Inspection (PCI) Programme, Summary Report, BWC/SP/CONF/WP. 2, September 20, 1994.
- UK Practice Inspection: Pharmaceutical Pilot Plant, BWC/CONF. III/VEREX/WP 141, May 24, 1993.
- UK Practice Inspection: Pharmaceutical Pilot Plant, BWC/CONF. III/VEREX/WP 147, (undated).
- Commercial Confidentiality Concerns Associated with Sampling and Analysis During On-Site Inspections Under the BWC, BWC/CONF. III/VEREX/NON. 28, (undated).

[13] Beyond VEREX: A Legally Binding Compliance Regime for the Biological Weapons Convention, Report of the Federation of American Scientists Working Group on Biological and Toxin Weapons Verification, July 1994.

See also " Implementation of the Proposals for a Verification Protocol to the Biological Weapons Convention", (FAS), Sept. 1991, op. cit., for the protocol of off-site and on-site data which the group proposed.

[14] For other major sources on BW verification see the following:
- Barbara Hatch Rosenberg and Gordon Burck, "Verification of Compliance with the Biological Weapons Convention", Chapter 14 in Susan Wright, (ed.), Preventing a Biological Arms Race, MIT Press, Cambridge, 1990, pp. 300-329.
- Oliver Thranert, (ed.), The Verification of the Biological Weapons Convention: Problems and Perspectives, Friedrich Ebert Stiftung, Bonn, May 1992.
- Susan Berger, "The Challenges of Chemical and Biological Weapons Arms Control Treaty Verification", in Elizabeth Kirk et. al. (eds.), Trends and Implications for Arms Control, Proliferation, and International Security in the Changing Global Environment, AAAS, American Association for the Advancement of Science, Washington, DC, 1993, pp. 175 to 189.
- Amb. Tibor Toth, et. al., "Verification of the BWC", and Nicholas A. Sims, "Control and Cooperation in Biological Defense Research: National Programmes and International Accountability", Chapters 6 and 7 in E. Geissler and J.P. Woodall (eds.), The Control of Dual-Threat Agents: The Vaccines for Peace Programme, SIPRI, The Stockholm International Peace Research Institute, Oxford University Press, Oxford, 1995, pp. -.
- M. Meselson et. al., "Verification of Biological and Toxin Weapons Disarmament", in Verification, Monitoring Disarmament, F. Calogero et. al., (eds.), Westview Press, Boulder, 1990, pp. 149 to 163.

One important question remains: can one distinguish microbiological research that is being carried out for "civil" purposes from that which is for military purposes. In research carried out some years ago I became confident that if one could not unequivocally answer "yes, absolutely", there were reasonably good indicators which could be gathered from scientific work to help make the distinction.[15] However, that task was made immeasurably more difficult once US BW R&D managers made the argument that in order to anticipate the nature of future BW threats that US military forces might encounter they had to produce novel surface antigens on pathogens, test organisms with increased virulence, or any other of the many other parameters that an offensive BW program might develop against US vaccines and defenses. This problem was described in a paper by Barbara Hatch Rosenberg, in 1988,

> "A central problem with the Convention is the blurring of the distinction between legitimate activities related to defense against biological weapons and illegitimate activities for offensive purposes. Scientists generally agree that offensive and defensive activities are largely indistinguishable.
>
> "Military insistence upon testing detection and protective devices against bona fide weapons agents means that information on offensive use of weapons agents will inevitably be obtained.
>
> "According to the US Department of Defense (DoD): 'Current requirements in biological defense include testing equipment against known and suspected threat agents. . . We especially need more information about protection against novel agents.' Because these agents do not exist, they will have to be created in order to study the threat they could pose. Threat evaluation also requires detailed information on 'new production and processing technologies as they apply to conventional and novel biological agents.'
>
> "The military is also interested in protective vaccines, which are useful not only as defense against an enemy attack, but are also required to protect aggressors. Such vaccines cannot be developed without possessing the agents themselves. Thus, defense without the potential for offense is essentially impossible, and all these 'defensive' activities are actually inconsistent with

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[15] I have attempted to resolve this question on two earlier occasions: in a study "Research and Development in (C)BW; An Examination of the Possibility of Distinguishing Between Civil and Military, Offensive and Defensive", that was written in 1970 as part of the SIPRI CBW project and presented at the International Congress of Microbiology, in Mexico City in 1970, and then in an expanded version for a book manuscript on Military Research and Development for the Ministry of Foreign Affairs of Sweden, in 1983-1984.

the convention's aim to exclude the possible use of biological and toxin agents as weapons."[16] The same counterproductive effects of maximizing the requirements of "defensive" research were pointed out by several others microbiologists writing on BW arms control, and they are a major theme of the book edited by Susan Wright in 1990, Preventing a Biological Arms Race.[17] Once one takes this position as a requirement for defensive research (omitting the issue of protective vaccines being required for the attacker), there is virtually nothing that cannot be done in a defensive research program, and everything becomes a matter of quantities, weapons development, and "intent".

An excellent example of this was demonstrated by the US Army request in 1984 to build a large aerosol test chamber at the Dugway Proving Ground ". . . to generate amounts of infectious agents that could potentially be used as biological weapons. The chief purpose of the facility would be to test whether the agents penetrate protective clothing and filters."[18] After several years of debate the Army cancelled its request in 1988 due to opposition precisely on the grounds that the facility would blur the distinction between defensive and offensive research. The US government had inactivated precisely such a large aerosol test chamber when it dismantled the offensive BW R&D program at Fort Detrick in the years 1969 to 1972. Even more ironically, when US inspectors found precisely the same kind of aerosol test chamber at the Soviet-Biopreparat facility at Obolensk in 1992-1993, and when UNSCOM inspectors found that another one had also been a part of the Iraqi facility at Al-Hakam but had been destroyed by Iraq before the inspectors got there, in both instances the presence of the test chamber was given as evidence of the offensive nature of the former Soviet and Iraqi BW programs.

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[16] Barbara Hatch Rosenberg, "International Biological Weapons Update", Genewatch, (July-October 1987), pp. 6-7, 15. (The DoD references are to US Department of Defense testimony to the House Committee on Appropriations, May 1986.)

[17] Susan Wright (ed.), Preventing a Biological Arms Race, The MIT Press, Cambridge, 1990. See in particular the following chapters:

- Susan Wright and Stuart Ketcham, "The Problem of Interpreting the US Biological Defense Program", pp. 169-196.
- Charles Piller and Keith R. Yamamoto, "The US Biological Defense Research Program in the 1980's: A Critique", pp. 133-168.
- Jonathan King and Harlee Strauss, "The Hazards of Defensive Biological Warfare Programs", pp. 120-132.
- Richard Novick and Seth Shulman, "New Forms of Biological Warfare?", pp. 103-119.
- "Recombinant DNA Projects Funded by US Military Agencies", Appendix L, pp. 413-420.
- also pp. 80-84, 87-97, 335-337, 340-351.

See also:

- Jonathan King and Harlee Strauss, "The Fallacy of Defensive Biological Weapons Programmes", in Biological and Toxin Weapons Today, Erhard Geissler (ed.), SIPRI, Stockholm International Peace Research Institute and Oxford University Press, 1986, pp. 66-81.
- Susan Wright, "Biowar Treaty in Danger", Bulletin of the Atomic Scientists, 47:7 (September 1991), pp. 36 to 40.

[18]
- Colin Norman, Army Shifts on Dugway Lab", Science, 241:4874, (September 30, 1988), p. 1749.
- Colin Norman, "Biological Defense Defended", Science, 240:4855, (May 20, 1988), p. 981.
- R. Jeffrey Smith, "Under Pressure, Army Scales Back Plan for Germ Warfare Lab", Washington Post, September 20, 1988.

When Soviet BW inspectors visited USAMRIID in 1991, officials there felt confident that precisely because of the expertise of the Soviet team they would understand how far the USAMRIID program was from one that intended weapon development. Nevertheless the visitors found portions of the US research program troubling; in this case what looked like an entirely open program to US research managers still posed problems for an outsider. One such aspect was USAMRIID research on toxins, precisely a portion of the Soviet basic research program that was frequently raised as a problematical issue in the 1980's. It is problems such as these dealing with "intent" that suggest that looking for production and weaponry might be more useful for an international BW inspection regime than examining research. And it is here too that formal aspects such as secrecy, the occurrence of covert BW programs run by military or intelligence agencies, and the role of military agencies in funding and operating BW research programs and institutions are shown to be highly important considerations.

Nevertheless, researchers have been able to prepare lists of indicators which quite usefully separate "civilian" from "military", and "offensive" from "defensive" microbiological research. As early as 1963 Morton prepared such a categorization which distinguished various aerobiological techniques according to their utility for "medicine", "defense", and "theory".[19] More recently, several additonal lists were included in the 1990 volume edited by Wright.[20]

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[19] J.D. Morton, table on "Relationship of Aerobiological Techniques to Useful Situations", in "Remarks from the Chair: A Critique", First International Symposium in Aerobiology, Berkeley, 1963, p. 186.

[20] Tables that differentiate BW R&D into military and civil, offensive, and defensive programs:
- M. Lappe, "Criteria for judging the likelihood of misuse of potential biological warfare research", in Susan Wright, ed., Preventing a Biological Arms Race, p. 88.
- Susan Wright and Stuart Ketcham, "Pathogens studied under DoD sponsorship as potential biological warfare agents compared with pathogens identified by the Institute of Medicine as the leading cause of disease in developing countries", in S. Wright, ed., 1990, pp. 178-179.
- C. Piller and K.R. Yamamoto, "US BW program development -- offensive development implications", (during the 1980s) in S. Wright, ed., 1990, p. 143.
- S. Wright and S. Ketcham, "Present activities conducted under the Biological Defense Program and related activities conducted under the Chemical Warfare Program", in S. Wright, ed., 1990, p. 189.

Summary:

Biological weapons were unfortunately not laid to rest in the years 1972 to 1975. Several nations have gone on to develop the capability to produce BW at short notice, and have done so precisely in the years since the Biological Weapons Convention came into force.

The USSR's and presently Russia's continuing delinquency in putting a certain and definitive end to its own BW program have been a severe impediment to international efforts to stop and to reverse any further trends towards BW proliferation. First, because Russia inherited one of the two major post-WWII offensive BW programs, and one which the USSR had continued despite signing and ratifying the BWC. That established an extremely damaging precedent, and the continued resistance to making a determined show of reparations by retroactively extirpating the remainders of the program once and for all only add further damage to the BWC. It is important that Russia remove whatever secrecy remains surrounding its BW establishments, both military and civilian. Second, because it weakens the combined efforts of the major powers in applying pressure on those nations that have more recently developed BW programs to begin reversing and expunging them.

Nations who have developed BW programs in recent years such as Iran and Libya are not particularly open to argument. The major institutional indicators, secrecy and the role of military or intelligence agencies in funding and managing BW programs, are constant indicators of problems, and most certainly when all three occur together. Much more thought should be given to the pressure of sanctions by the international community. Following the additional example of Iraq, a state that had gone on to develop BW despite having signed (although not ratified) the BWC, much more thought particularly needs to be given to the circumstances in which a State Party to the BWC shows evidence of developing the prohibited weapon system, and the sanctions that should be applied in such instances.

It appears that the next year will see the proposal of an international verification regime as a Protocol

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See also:

- Barend ter Haar, The Future of Biological Weapons, The Washington Papers, No. 151, Center for Strategic and International Studies, Washington and Praeger, New York, 1991, particularly pp. 54 to 75, and the table "Activities permitted or prohibited in the Biological Weapons Convention", p. 63.
- USAMRIID; United States Army Research Institute of Infectious Diseases, 1995.
- FOA 4; In the Service of the Swedish Total Defense and of the Entire Community, 1986.

to the BWC. It would require an international monitoring organization, probably similar to that which has been established under the Chemical Weapons Convention. It is very likely that such a regime will provide for the opportunity for both routine and challenge on-site inspections to facilities or locations in member states. Domestically, the US government runs the risk of having impeded its current efforts to defeat the further spread of a weapon of mass destruction by greatly exaggerated concerns several years ago regarding corporate commercial secrecy. Trial inspections carried out by several western nations in recent years as a contribution toward producing a strengthened verification regime for the BWC showed that this was a manageable concern. It will be important for the US government to maintain its focus on stemming BW proliferation as its first and overwhelming priority, and that all its other considerations that relate to that effort be so adapted as to aid in that endeavor.

In that regard, Senate ratification of the Chemical Weapons Convention would be a crucially important step, establishing the US interest in a serious verification regime in the C and B area. Obviously, that means ending the ability of a single US Senator to prevent a major arms control treaty on one of the three categories of weapons of mass destruction--a treaty that the Bush Administration had championed, that the United States signed, and that took over twenty years of international negotiation to achieve--from being put to the US Senate for ratification.

THE HENRY L. STIMSON CENTER

News Advisory

Senate Permanent Subcommittee
on Investigations
EXHIBIT # 1a.

Alarm Sounded About Security of Russia's Chemical Weapons

- **October 2, 1995**
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Russia's chemical weapons stockpile storage sites appear to be vulnerable to theft from within and attack from without, according to a report released today by the Henry L. Stimson Center in Washington, D.C. Based on eyewitness accounts, the report describes the security surrounding Russia's 40,000 metric ton chemical weapons arsenal—over 80 percent of which is lethal nerve agents—as falling far short of the security provisions taken at U.S. chemical weapons storage sites.

One witness described the security as suitable only "to keep an honest man out." Congressman Glen Browder (D-AL), who had visited one of the sites, observed, "Their facilities were not as secure as ours, especially regarding physical security" measures. Amy E. Smithson's essay on security is the first of four in the report, *Chemical Weapons Disarmament in Russia: Problems and Prospects*.

After the terrorist use of chemical weapons in Japan last March and April, the Stimson Center examined the security of the chemical weapons stored at seven locations in Russia. Like the prospect of "loose nukes," loose or stolen chemical weapons could present a real danger to global security. "Once stolen," notes an expert in the report, "a chemical weapon is far easier for a terrorist....to use than a nuclear weapon." Smithson provides a sobering picture of the "rudimentary" security measures that appear to be in place, and recommends some low-tech, relatively low cost measures that could significantly improve security. "The price of assisting Russia now is much lower than the cost that may be incurred later if this problem is not promptly addressed," she concludes.

"We cannot overstate the threat posed by the proliferation of these weapons..." Sen. Sam Nunn

In late October, the U.S. Senate's Permanent Subcommittee on Investigations is planning to examine issues related to the threat posed by chemical weapons. Senator Sam Nunn (D-GA), ranking member of the Subcommittee, said, "We cannot overstate the threat posed by these weapons, nor can we afford to wait until the aftermath of a tragedy to critically address these concerns."

Congress has at its fingertips two mechanisms it can activate. The first is the Cooperative Threat Reduction program, which has channeled U.S. assistance to Russia, Ukraine, Belarus, and Kazakhstan to help secure former Soviet nuclear weapons and to begin dismantling them. This program has reduced the chances that former Soviet nuclear weapons might fall into the wrong hands.

The second mechanism is the Chemical Weapons Convention (CWC). When in force, the CWC could bring international inspectors to Russian storage sites to inventory and secure these weapons. If the Senate ratifies this treaty, pressure will increase for Russia to do the same, thus opening its facilities to inspection. The CWC has been awaiting Senate action for almost two years. After numerous hearings in 1994, none have been held this year.

"Once stolen, a chemical weapon is far easier for a terrorist...to use than a nuclear weapon."

Dr. Vil Mirzayanov, a 26-year veteran of the Soviet chemical weapons complex, argues in the Stimson report that the Senate must ratify the CWC so that this weapons development program can be brought under international scrutiny and control. In states that have ratified the treaty, routine inspections as well as short-notice challenge inspections can occur at *any* site suspected of conducting prohibited activities. A refusal of a challenge inspection is an automatic violation of the Convention.

Mirzayanov is the scientist and whistleblower who charges that a Soviet program developed a new generation of chemical agents, apparently breaking Mikhail Gorbachev's 1987 pledge that the USSR had ceased producing chemical weapons. Questions remain about the extent of this program and how many of these activities continued after the Russian government came to power.

As Mirzayanov states, "If the CWC's procedures are not instituted, the Russian chemical weapons complex will remain accountable only to the same clique of leaders, who have thus far not proven their trustworthiness." Smithson agrees, noting, "No matter how detailed a map Mirzayanov and other whistleblowers provide of [this]....program, without the CWC that map will be of little avail." In order to rein in this program, Mirzayanov asks for the Senate's prompt ratification of the CWC.

"No matter how detailed a map Mirzayanov and other whistleblowers provide... without the CWC that map will be of little avail."

Maj. Gen. Roland Lajoie, USA (Ret.), the Deputy Assistant Secretary of Defense for the Cooperative Threat Reduction Program, notes in the Stimson report how important it is to get a destruction program started in Russia. Economic difficulties and political disarray have complicated the Russian government's efforts to launch such a program. Only approximately five percent of the total funds authorized for the Cooperative Threat Reduction program have gone toward Russia's chemical weapons destruction program. With U.S. assistance now, Lajoie states, "Russia will be much better prepared to carry out destruction operations at other storage facilities and continue down the path of CWC implementation."

In her concluding essay, Smithson quotes one of those who had been to Russian chemical weapons storage facilities: "The best security is to get rid of it." She argues that ratifying the CWC, "tightening security around Russia's chemical weapons stockpile, and hastening its destruction will measurably reduce the possibility that Russian chemical weapons will one day harm Americans."

This report is a product of the Chemical Weapons Convention Implementation Project, which is funded by the Carnegie Corporation of New York. Smithson, a senior associate at the Stimson Center, directs this project. The Henry L. Stimson Center is a nonprofit, nonpartisan research institution devoted to public policy research. The Stimson Center concentrates on particularly difficult national and international security issues where policy, technology, and politics intersect.

THE HENRY L. STIMSON CENTER

Chemical Weapons Disarmament in Russia: Problems and Prospects

Amy E. Smithson
Dr. Vil S. Mirzayanov
Maj. Gen. Roland Lajoie (USA, Ret.)
Michael Krepon

Report No. 17   October 1995

Pragmatic steps toward ideal objectives

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List of Abbreviations

BDA	Bilateral Destruction Agreement
CAL	Central Analytical Laboratory
CD	Conference on Disarmament
CTR	Cooperative Threat Reduction
CWC	Chemical Weapons Convention
CWDSO	Chemical Weapons Destruction Support Office
DNA	Defense Nuclear Agency
DOD	(U.S.) Department of Defense
FCS	(Russian) Federal Counterintelligence Service
GosNIIOKhT	(Soviet/Russian) State Scientific Research Institute of Organic Chemistry and Technology
MOD	(Russian) Ministry of Defense
MOU	Memorandum of Understanding
NATO	North Atlantic Treaty Organization
NIS	Newly Independent States
OPCW	Organization for the Prohibition of Chemical Weapons
OSIA	On-Site Inspection Agency
PAL	Permissive Action Link
WMD	Weapons of Mass Destruction

Introduction

Michael Krepon

A strange fate has befallen the Chemical Weapons Convention (CWC). Enmeshed in partisan wrangling between the executive and legislative branches, the CWC remains in limbo, both in Washington and Moscow. Hearings have been held and reports filed, but no votes have been taken in either country. In other words, the two countries most required for the CWC's successful entry into force have yet to ratify the accord.

With Moscow in a reactive mode, the task of prompting the CWC's ratification and successful implementation falls on Washington. If the Senate consents to the CWC's ratification, there is no assurance that the Duma will follow. If, however, the Senate fails to act, there is little incentive for the Duma to stretch from its defensive crouch.

As this collection of essays acknowledges, the decision before the Senate is not free of complication. The toughest questions are tackled directly in the pages that follow. Will Russian authorities be able to comply with treaty provisions even if they want to because of insufficient resources? What if Russian authorities do not want to comply fully with the CWC?

As Amy Smithson makes abundantly clear in her lead essay, Russian security for existing stocks is insufficient. Ms. Smithson observes that "Russia's chemical weapons storage sites appear to be vulnerable to theft from within and attack from without." Given the frightening example of the terrorist use of chemical weapons in Japan in March and April of 1995, she concludes that "The price of assisting Russia now is much lower than the cost that may be incurred later if this problem is not promptly addressed."

While many of the corrective measures advocated by Ms. Smithson are inexpensive and essential for the security of Russian citizens, even these small steps may be difficult for the Russian government to take. Moscow may be forced to split scarce rubles between improved security and destruction of the Russian stockpile, she notes, increasing the likelihood that progress will be slow and insufficient on both fronts. U.S. interests will best be served if these tasks are accomplished quickly and well.

Russian compliance with the CWC must be proven for it cannot be assumed. Yet Russia has no obligations to stop development of new chemical agents or to dismantle existing stocks without the CWC's entry into force. Those concerned with the possibility of Russian noncompliance need the investigative tools that the CWC provides. The advice of Russian whistleblower Dr. Vil S. Mirzayanov is especially important in this regard. "I now understand that the CWC provides the means to bring the Russian chemical weapons complex under international monitoring," he states. "If the CWC's procedures are not instituted, the Russian chemical weapons complex will remain accountable only to the same clique of leaders, who have thus far not proven their trustworthiness." Mirzayanov, a former employee of the Soviet chemical complex and prisoner of conscience for revealing chemical weapons-related activities, notes that Russians as well as Americans who wish for a complete accounting and halt to prohibited chemical weapons activities will be badly hurt by non-ratification.

In his essay, Mirzayanov describes what happened when he blew the whistle on the actions of Soviet authorities. He explains that "tens of tons" of new binary agents were produced in "experimental quantities," mostly for testing purposes. Mirzayanov states that the quantity involved "is not significant in the military sense."

It is also essential for the United States to provide more assistance to a Russia that has begun to take corrective measures to improve security around its chemical weapons and destroy its stockpile. The Russian government's efforts to initiate a destruction program have been frustrated by a lack of resources, public resistance and fear, and the absence of the legal and bureaucratic infrastructure to execute such a complicated program. As Maj. Gen. Roland Lajoie, (USA, Ret.) explains in his essay, the focus of U.S. assistance has been to "jump-start" Russia's efforts to destroy the nerve agents that comprise over 80 percent of Russia's stockpile.

"The objective of U.S. assistance," Lajoie states, "is not to achieve the complete destruction of the Russian chemical weapons stockpile—that goal is beyond the scope of the Cooperative Threat Reduction program both in terms of cost and time." With assistance from the United States and other countries at the outset, however, he argues that "Russia will be much better prepared to carry out destruction operations at the other storage facilities and continue down the path of CWC implementation."

Ms. Smithson's concluding essay makes a powerful case for the prompt ratification and entry into force of the CWC. The best way to help whistleblowers in the former Soviet Union and to advance U.S. national security is to pry open the old Soviet CW complex with the CWC's monitoring provisions. As Ms. Smithson notes, "Until the U.S. Senate gives its consent to ratification of the CWC, it will be in the untenable position of complaining about possible activities in Russia that may violate a law that does not exist. No matter how detailed a map Mirzayanov and other whistleblowers provide of the novichok program, without the CWC that map will be of little avail."

As for providing U.S. resources to improve security of the Russian stockpile and speed its destruction, Ms. Smithson quotes one of those she interviewed: "The best security is to get rid of it." Accordingly, she argues that "tightening security around Russia's chemical weapons stockpile and hastening its destruction will measurably reduce the possibility that Russian chemical weapons will one day harm Americans." Executive and legislative branch leaders within Russia and the United States are obligated to pay more attention to these pressing problems.

The international community has a choice: either to reinforce international norms against chemical weapons and establish an effective international agency to monitor the CWC or to let these opportunities pass and to live in a world without the CWC. As Ms. Smithson's notes in her analysis, "The CWC is best suited to help the United States reach its near-term objective to resolve problems in Russia and its long-range objectives regarding nonproliferation policy and chemical weapons disarmament."

The Stimson Center wishes to thank the authors of these essays for their time and effort. In addition, Maj. Gen. Lajoie's capable assistant Kevin Flamm was always helpful in providing information about the status of U.S. Cooperative Threat Reduction programming in Russia. Gale Colby dedicated a great deal of time and attention to Dr. Mirzayanov's discussion of the Soviet/Russian chemical weapons program. Those who worked with Ms. Smithson on her first essay, including Congressman Glen Browder (D-Alabama) and other interviewees who requested anonymity, gave generously of their time and personal experience regarding chemical weapons security in Russia and the United States.

A number of individuals at the Stimson Center helped prepare this report. Senior Associate Joseph Cirincione furnished constructive suggestions and critical assessments. Laurie H. Boulden supplied indefatigable research assistance for the entire report and also managed to compile the chronology in the appendix. Sony Devabhaktuni, Jill Junnola, Howard Kee, Michele Siders, Kathleen Walsh, and Christine Wormuth helped proof the text. Laurie Boulden and Jane Dorsey deserve credit for its polished finish.

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Improving the Security of Russia's Chemical Weapons Stockpile

Amy E. Smithson

On March 20th, religious zealots in Japan broke a taboo against use of weapons of mass destruction by terrorists and, in the process, provided an ominous glimpse into future acts of terrorism. Contrary to most expectations and fears, the weapon of choice was not nuclear, but chemical. Twelve were killed and over 5,000 injured when the nerve gas sarin was released during the morning rush hour on Tokyo's crowded subway system.[1] Now that this line has been crossed, other terrorists and leaders of rogue states may try to follow in Aum Shinrikyo's path.

Moreover, U.S. policy makers need only recall the terrorists acts in New York City in 1991 and Oklahoma City in 1995 that stunned the whole world to face the ugly possibility that chemical terrorism could migrate to U.S. shores or even originate here. President Bill Clinton observed, "In light of what happened in Japan, all advanced countries should be very, very concerned about the prospect of the merger of terrorism with weapons of mass destruction."[2] For example, the effective use of chemical agents instead of conventional explosives in the 1991 terrorist attack against the World Trade Center would have totally devastated the building's occupants within a few moments.[3]

When the Soviet Union collapsed, much attention was given to the possibility that nuclear weapons or their components could find their way into the wrong hands. The frightening prospect of "loose nukes" prompted Senators Richard Lugar (R-Indiana) and Sam Nunn (D-Georgia) to launch a program to help Russia, Belarus, Ukraine, and Kazakhstan secure these weapons and begin safely dismantling their delivery vehicles according to treaty requirements. The Cooperative Threat Reduction (CTR) program got off to a slow start because umbrella agreements had to be negotiated with the former Soviet states and the Defense Department had to award contracts to U.S. companies to provide the appropriate goods and services.[4] However, there is widespread agreement that the CTR program has made impressive strides in improving the security of former Soviet nuclear weapons, facilitating the dismantlement of delivery vehicles, and providing assistance and opportunities to enable Russia's nuclear experts to apply their skills to peaceful uses, not to nuclear proliferators or terrorists.

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[1] Nicholas D. Kristof, "Hundreds in Japan Hunt Gas Attackers After 8 Die: Police Tighten Security Steps at Stations," *New York Times*, 21 March 1995, A1; Lois Ember, "Tokyo Subway Attack: Chemical Weapon Possible Terrorist Tool," *Chemical & Engineering News* (27 March 1995): 6-7; "Gas Attacks Renew Fears For Japanese," *Washington Post*, 15 July 1995, A20.

[2] President William J. Clinton, Joint Press Conference by President Clinton and President Boris Yeltsin, Moscow, 10 May 1995.

[3] See Victor A. Utgoff, *The Challenge of Chemical Weapons: An American Perspective* (New York: St. Martin's Press, 1991), 241-2. See also, Anthony H. Cordesman, "One Half Cheer for the CWC: Putting the Chemical Weapons Convention in Military Perspective," in *Ratifying the Chemical Weapons Convention*, ed. Brad Roberts (Washington, D.C.: Center for Strategic and International Studies, 1994), 44.

[4] Dunbar Lockwood, "Getting Down to Business," *Bulletin of the Atomic Scientists* 51, no. 1 (January/February 1995): 12-13. For more on the former Soviet nuclear arsenal and the evolution of the CTR program, see Zachary S. Davis and Jason D. Ellis, "Nuclear Proliferation: Problems in the States of the Former Soviet Union," CRS Issue Brief IB91129 (Washington, D.C.: Library of Congress, Congressional Research Service, 28 June 1995); Amy F. Woolf and Theodor

Perhaps because U.S. policy makers have been so preoccupied with addressing the nuclear agenda, comparatively little thought has been given to chemical matters. However, it is prudent to examine the potential for theft and black marketeering of Russia's chemical weapons given Japan's horrifying encounter with chemical terrorism. Nerve agents, including VX, sarin, and soman, comprise over 80 percent of Russia's 40,000 metric ton chemical arsenal.[5] With regard to Russia's chemical weapons storage facilities, Russian Army Chief of Staff Gen. Mikhail Kolesnikov recently described the security measures at these facilities as "inadequate," pointing out that the chemical arsenal is "more vulnerable to theft" since the location of Russia's seven storage facilities has become a matter of public record.[6] This information was classified until mid-January 1994, when *Rossiiskaya Gazeta* published the amount and types of chemical agents stored at each site.[7] Russia's blister agents—mustard and lewisite—are stored at Gorny and Kambarka. The remaining sites are Kizner, Leonidovka, Maradykovsky, Pochep, and Shchuche. These sites store mostly nerve agents, such as VX, sarin, and soman. For a map of these sites and the types of munitions stored at each, see page 36.

Some of those who have been to Russia's chemical weapons storage facilities provide a disquieting picture regarding the security of the sites. The following paragraphs provide a general description of the security provisions that appear to be in place at four of the seven Russian storage sites.[8] While this description is based on first-hand accounts, some caveats must be attached to it. First, these eyewitnesses may not have noticed all of the security measures present. Second, Russian officials may have purposefully changed their practices while visitors were present or after they left to protect the integrity of their security measures. Third, Russian officials may have controlled the visit so that outsiders saw only partial views of the facilities. Fourth, the differences observed in security from one site to another may be attributed to one or more of these factors. Finally, these accounts may be biased toward Western security practices.

W. Galdi, "Nuclear Weapons in the Former Soviet Union: Location, Command, and Control," CRS Issue Brief IB91144 (Washington, D.C.: Library of Congress, Congressional Research Service, 13 February 1995); U.S. General Accounting Office, *Weapons of Mass Destruction: Reducing the Threat From the Former Soviet Union*, GAO/NSIAD-95-7 (Washington, D.C.: U.S. General Accounting Office, October 1994).

[5] About 70 percent of the 32,500 metric tons of nerve agent in Russia's stockpile is in air-delivered munitions. Walter L. Busbee, "Now for the Heavy Lifting: Destroying CW Stockpiles in the United States and Russia," in *Ratifying the Chemical Weapons Convention*, 111.

[6] "Russian Security Inadequate for Chemical Weapons Storage," Agence France Presse, 2 August 1995.

[7] Igor Vlasov, "Chemical Splinters in Russia's Body," *Rossiiskaya Gazeta*, 15 January 1994, 3.

[8] The author interviewed people who had visited one or more Russian facilities, asking them about security measures they did or did not observe. Those interviewed were at these facilities for varying periods of time, from hours to days. Several of these individuals, who had different affiliations, gave descriptions of specific sites. The author has elected to provide a general description, accompanied by examples, without identifying the particular sites involved. She would like to emphasize that no one who spoke with her revealed classified information. For a rare and brief public account of a U.S. inspection conducted under the Wyoming Memorandum of Understanding, see Joseph D. Richard, "'Team Morris' Inspects Russia's Pochep Facility," *On-Site Insights* 6, no. 8 (September 1994), 4-5.

Security for chemical weapons has three basic components: physical barriers at a particular site, human controls/guards, and the system of accountability. Ideally, these components work together to block theft from outside or inside the facility. Physical barriers are items such as fences, locks, and other security devices intended to deter an attack against a facility or impede the attackers until guards can respond. Guards at a facility control access to the compound, monitoring the perimeter and checking vehicle and pedestrian traffic to prevent unauthorized personnel from entering. If the physical security at a facility were to be breached, it is the responsibility of these troops to respond, engage, and fend off attackers. The system of accountability entails the procedures that a nation uses to keep track of chemical weapons in the inventory and the chemical agent in bulk storage at various sites.

Physical Security at Russian Chemical Weapons Storage Sites

In general, outsiders who have been to Russian chemical weapons storage facilities characterize the security at these sites as similar to the measures commonplace at U.S. storage facilities in the 1950s. Since then, the United States has switched to an approach that employs significant physical barriers, intruder alarms, and other electronic sensors monitored from a central security control room.[9] In contrast, Russian chemical weapons storage facilities have the bare basics of physical security for a sensitive military site—multiple exterior fences, storage buildings, and padlocks.[10]

One of the storage sites visited was a stand-alone facility, but the others were inside or collocated with a larger military compound.[11] Normally, the chemical weapons storage area had different entrances for pedestrians, road vehicles, and railroad cars. At two sites, a two-gate entrapment system was used at the main entry. Guards were present at the main gates at all facilities.[12] Railroad entrances—padlocked double-opening fences were observed—did not appear to be guarded.[13] More than one individual observed that the railroad tracks into the restricted chemical storage area were rusted, with grass overgrowing the tracks, and did not look like they had been used in a long time.[14] At one facility that was adjacent to another compound, an unguarded gate in the fence separating the two areas could be seen.[15]

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[9] Interviews by author, 28 July 1995, 31 July 1995, and 11 August 1995.

[10] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995, 31 August 1995, 18 September 1995.

[11] Interviews by author, 28 July 1995, 31 July 1995, 31 August 1995, 18 September 1995. According to Representative Glen Browder (D-Alabama), family housing units were inside the larger military compound at one storage site, with children playing nearby the restricted chemical storage area. Interview with Congressman Glen Browder, Washington, D.C., 14 September 1995.

[12] Interviews by author, 28 July 1995, 31 July 1995, 31 August 1995, 18 September 1995. At one of the entries to the restricted area at one site, the guard was inside a plexiglass booth and pedestrians had to pass through a turnstile. Interview by author, 21 August 1995. In a two-gate entrapment, entering vehicles are stopped between the outer and inner gates, while the guard checks identification prior to opening the inner gate.

[13] Interviews by author, 31 July 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[14] Interviews, 28 July 1995, 11 August 1995.

[15] Interview by author, 31 August 1995.

Different combinations of fences are used for perimeter security at Russian chemical weapon storage sites. Some fences were chain-link, some were barbed wire, and some were apparently electrified. Two concentric exterior fences were erected at some sites, three or four fence lines at others. Some fences were in good repair, others appeared to be poorly maintained. At one site where the storage facility was inside a larger compound, a wall, approximately eight feet high, had been erected around the chemical weapons storage area.[16] One interviewee described the outer fencing as "tall cattle fences."[17] The zone between the innermost and outermost fences was cleared and well-maintained at some sites, allowing for foot or vehicle patrols. In some cases, a clear zone was established outside the outermost fence and a worn path indicating perimeter patrols was evident. In other cases, the outermost fence was directly adjacent to a village or wooded area, and the direction of the observed paths indicated pedestrian traffic to and from a nearby village, not perimeter guard activities.[18] According to one individual, at one site "there had been clear zones," but this area was not well-maintained.[19] At two sites, perimeter lights along the fence line were seen, but the lights were few in number and did not appear to be well-maintained.[20] Perimeter lights were not observed at the other facilities.[21] No electronic security devices, such as closed-circuit or low-light TV cameras, were observed on or near the exterior fences.[22]

Some storage buildings were constructed with cement blocks and had wooden or steel-faced doors.[23] Others were made only of wood and had wooden doors and windows with bars. The roofs of these buildings were often made of tile or wood. At one site, holes could be seen in the roof, but at other sites, the buildings were well-maintained. The buildings at one facility had just been re-roofed.[24] Several people interviewed observed nothing other than a single-key padlock on the doors to storage buildings.[25] At one site, the doors to storage buildings had an additional bar across the door required a separate device or key to unlock, but the lower section of these doors had unsecured lift-up "dog doors" used for first-entry monitoring. Given the "material of construction and the kinds of locks they used, it was nothing that a locksmith couldn't defeat," said one interviewee.[26] Intruder detection devices—probably a circuit-breaker mechanisms—were observed on the doors to individual storage buildings at second site and possibly at a third.[27] No one recalled electronic or other intruder detection sensors on the other openings to these buildings (e.g., windows).[28]

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[16] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[17] Interview by author, 18 September 1995.

[18] Interviews by author, 11 August 1995, 21 August 1995, 31 August 1995.

[19] Interview by author, 18 September 1995.

[20] Interviews by author, 28 July 1995, 31 July 1995, 31 August 1995.

[21] Interviews by author, 11 August 1995, 21 August 1995, 18 September 1995.

[22] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995, 21 August 1995, 18 September 1995. Browder did not observe any electronic surveillance or intruder detection equipment at one site. Interview with Browder, 14 September 1995.

[23] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 31 August 1995, 18 September 1995. Some of the cement block buildings at one site had large openings, approximately 6 feet by 6 feet, that were covered by a wire mesh grill. Interview by author, 28 July 1995.

[24] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 31 August 1995, 18 September 1995.

[25] Interviews by author, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995.

[26] Interview by author, 18 September 1995.

Inside these buildings, munitions were kept in racks, similar to the storage of wine bottles, or stacked horizontally on wooden pallets. Bulk storage drums were elevated on beams to facilitate monitoring for corrosion or a clean-up effort in the event of a leak.[29] Smaller items, like munitions and storage drums were numbered, most likely with production lot, not serial, numbers.[30] Missile warheads also appeared to be marked with production lot numbers. Each warhead had its own numbered storage container.[31] At one site, caged birds were kept inside the cement storage buildings—a time-tested method of detecting whether chemical agent is present. The death of the bird is a likely indicator of a leaking weapon or container.[32]

The munitions and bulk storage containers observed were well-maintained, in good to excellent condition.[33] As Congressman Glen Browder (D-Alabama) reported after a visiting a Russian storage site in 1994, "The chemical shells and warheads which we inspected appeared to be in good condition, having been manufactured between the early 1950s and mid-1980s, and were battlefield-ready."[34]

Interviewees did not observe physical barriers, such as an large obstacle that would have to be moved, in front of storage building doors. Nor were tamper detection seals seen on any storage building doors.[35] Seals were used sporadically at some sites, apparently not at all at others. For example, the large 50-cubic meter storage tanks and storage drums were sealed at one site, but at another, these large storage tanks apparently were not sealed. The containers for missile warheads were sealed at one site, but the other items there were not sealed. The seals that were observed were wire-loop or lead seals that were dated and numbered. Ostensibly, either the seal has to be broken or the wire cut to open them.[36]

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[27] Interview by author, 28 July 1995. At one site, an individual saw what might have been a roller or switch on the door, but could not be certain that that was the case. The accompanying soldier did telephone someone before unlocking the door to enter the building. Interview by author, 31 August 1995.

[28] Browder did not observe any electronic surveillance or intruder detection equipment at one site. Interview with Browder, 14 September 1995. Nor did others observe such devices on storage doors or within buildings. Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 30 August 1995, 18 September 1995.

[29] Interviews by author, 31 July 1995, 11 August 1995, 21 August 1995, 18 September 1995.

[30] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 31 August 1995, 18 September 1995.

[31] Interviews by author, 31 August 1995, 18 September 1995.

[32] Interview by author, 31 July 1995.

[33] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[34] Representative Glen Browder, Memorandum to Representative Ronald V. Dellums, Chairman, House Armed Services Committee, "July 3-10 Codel to Concerning Chemical Weapons," 25 July 1994.

[35] Interviews by author, 31 July 1995, 11 August 1995, 31 August 1995, 18 September 1995.

[36] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 18 September 1995.

Guards and Accountability at Russian Chemical Weapons Storage Sites

Physical security aside, more than one individual interviewed dwelled on the human component of security at Russia's chemical weapons storage facilities. As noted, main gates were guarded and the identification of visitors was checked before they were allowed to enter. Visitors were issued badges.[37] Armed perimeter patrols were seen at some sites, but not at others. Guards were not stationed at individual storage buildings at the time that visitors were there. The troops encountered were courteous and well-disciplined. Morale was good; these soldiers did not appear to be discontent.[38] One individual observed that there were "No signs of things falling apart around the seams," but another noted that one site was poorly maintained.[39] Soldiers had expressed concerns about "bandits" in the area, recalled one interviewee.[40]

Following Soviet precedent for tracking the whereabouts of weapons, the soldiers at these facilities use a "personalized" system of accountability. Officers are personally responsible for the chemical weapons stored within a given number of buildings, usually one to five buildings. With smaller items such as artillery shells, this means that a single officer can be responsible for hundreds of weapons. If something is missing, this officer is held accountable. Written records are kept, and the location of munitions or drums is noted on a planograph or a diagram of the building's contents. A computer database, however, is not used.[41]

At some sites, soldiers stated that they entered storage buildings frequently, even on a daily basis, for maintenance and inventory activities.[42] Such statements could not, of course, be confirmed. However, some individuals witnessed inventory and maintenance procedures. For example, racks of munitions, stacked from the floor to the ceiling, were painstakingly inventoried, as were rows of storage drums. Results were recorded on the aforementioned planograph.[43] Soldiers used a 15-foot long dipstick to measure the level of agent in the 50-cubic meter storage tanks. They also conducted an analysis of the contents to ascertain the concentration of key chemicals. To prevent the rupture of storage drums, it is standard Russian procedure to open these drums periodically to relieve the gas pressure that builds up inside. Storage drums, tanks, and munitions were checked for signs of disrepair or corrosion.[44]

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[37] Interviews by author, 31 July 1995, 21 August 1995, 31 August 1995, 18 September 1995.

[38] Interviews by author, 28 July 1995, 31 July 1995, 11 August 1995, 21 August 1995. At one site, the enlisted soldiers were "run-of-the-mill," not the type of soldier that would be assigned to guard sensitive military facilities in the West. The officers were "clearly disgruntled at having to open the facility" to outsiders. Interview by author, 18 September 1995. In contrast, Browder noted that inside the chemical weapons storage section, his hosts were quite open to having him look around the site. Browder, interview by author, 14 September 1995.

[39] The first comment was made in an 11 August 1995 interview; the second in an 18 September 1995 interview.

[40] Interview by author, 31 August 1995.

[41] Interviews by author, 30 August 1995, 31 August 1995.

[42] Interviews by author, 31 July 1995, 30 August 1995.

[43] Interviews by author, 31 July 1995, 31 August 1995.

[44] Interviews by author, 31 July 1995, 11 August 1995.

Evaluating the Security of Russia's Chemical Arsenal

In some respects, the security measures described above do not appear to be too far out of order. Thieves cannot just walk off with a 50-cubic meter tank full of chemical agent.[45] Racks of artillery shells are placed so close together that it would be difficult to maneuver lifting equipment inside the building to cart off several racks of artillery shells.[46] Some storage sites are a restricted area inside of a larger military compound, which would make it more difficult to violate security. In other words, the way that Russian chemical weapons and bulk agent are stored creates some built-in security features.

In other instances, this account raises some grave concerns, especially for those who are familiar with routine security procedures at sensitive U.S. military sites. By U.S. standards, Russian chemical weapon storage facilities unquestionably appear to be vulnerable to attack from outside and theft from within. In the discussion that follows, apparent shortfalls are identified and possible scenarios for foul play are raised. General U.S. standards of physical security and accountability practices are presented as a point of comparison.

Shortcomings in the physical security were readily apparent at the Russian storage facilities visited. For example, perimeter fences lacked electronic sensors and intrusion detection devices. In the absence of well-maintained clear zones and perimeter lighting, attackers have more cover for a stealthy approach. Railroad entrances at these facilities could be a particularly egregious breach of perimeter security, since they were apparently unguarded and secured only with a single-key padlock.[47] Single-key padlocks were frequently the only visible barrier to entrance at individual storage buildings. Additional physical barriers were not seen. In the majority of cases, intrusion detection devices apparently were not installed.[48] A lone padlock on any door, especially a wooden door, is hardly an impediment to thieves or attackers. At the one site where storage tanks and drums were sealed, the technology used was not tamper-proof.[49]

These measures fall far short of the physical security at U.S. chemical weapons storage sites. For example, two continuous lines of intrusion detection sensors, as well as imaging systems (e.g., closed-circuit TV, radar, and infrared detectors), buttress perimeter fencing, lighting, and clear zones. Where appropriate, vehicle barriers such as concrete blocks, ditches, and posts embedded in the ground are situated to prevent vehicles from crashing gates or fences. In addition, huge concrete blocks are placed immediately in front of the entrance of U.S. bulk storage buildings, which are built of concrete and sometimes also bermed. These so-called "King Tut" blocks are so heavy that a forklift must remove them to enable access. U.S. regulations require that two soldiers be present to open a storage building. Each has possession of a separate key to unlock one of the two high-security padlocks on the door. When entry occurs, at least one other soldier will be alerted. Balanced magnetic switches or other intrusion detection sensors are placed on all doors, windows, and movable openings of U.S. storage buildings. These sensors, which are tamper-protected, automatically notify the security control center, which is manned 24 hours a day, of intrusions of perimeter and individual building security.[50] Table 1 compares the security measures generally practiced at U.S. storage sites with the physical security observed at some Russian storage sites.

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[45] Interview by author, 11 August 1995.

[46] Interview by author, 21 August 1995.

[47] Interviews by author, 21 August 1995, 30 August 1995, 31 August 1995.

[48] Interviews by author, 11 August 1995, 21 August 1995, 31 August 1995.

[49] To foil these wire loop or lead seals without detection, the thief would need to replicate the seal that leaves an imprint on the lead. This type of sealing technology was common in the 1970s. Fiber-optic, tamper-proof seals can now be readily obtained. Interview by author, 28 July 1995. Another person noted that the Russians also use a "primitive" string and clay pot seal at nuclear facilities, which can be spoofed by un-threading the string to gain access and then rethreading the string through the clay in the pot. As noted, much more advanced seal technology is available. Interview by author, 30 August 1995.

Of the physical security at Russian chemical weapons storage sites, one interviewee characterized it as suitable "to keep an honest man out," another as "rudimentary."[51] A much harsher assessment was offered by another individual, who concluded, "You could really walk into that place without any problem."[52] Browder observed that "Their facilities were not as secure as ours, especially regarding physical security."[53] Yet another person acknowledged the shortcomings in physical security, but thought that Russia's chemical weapons are probably "secure as long as the people who are guarding them want them to be safe."[54] This statement brings up a different set of concerns related to the Russian system of accountability and potential problems among Russian troops and chemical weapons experts.

A fair amount of Russia's chemical agent is in bulk storage containers. One is not counting munitions as much as tons of agent. While measurements from large storage tanks provide a rough idea of how much agent is there, these circumstances could present an accountability problem.[55] Chemical agents are not stable and tend to deteriorate gradually. Unless the seals on these tanks are tamper-proof and daily measurements, both of quantity and quality, are taken and cross-checked by individuals that are not within the immediate chain of accountability, it would be difficult in the event of a discrepancy to tell whether chemical agent leaked or was stolen. In other words, there did not appear to be significant obstacles to prevent someone from systematically skimming small quantities of agent out of bulk storage containers.[56]

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[50] *Military Police: Chemical Agent Security Program*, Army Regulation 190-59 (Washington, D.C.: Department of the Army, 27 June 1994), 6-11, 16-17, 37. Interviews by author, 11 August 1995, 21 August 1995, 31 August 1995. Other documents that stipulate the security and safety practices followed at U.S. chemical weapons storage sites include *Chemical Surety*, Army Regulation 50-6 (Washington, D.C.: Department of the Army, 12 November 1986); *Safety: Toxic Chemical Agent Safety Standards*, Pamphlet 385-61 (Washington, D.C.: Department of the Army, currently being revised); *Medical Services: Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard Agents H, HD, and HT*, Pamphlet 40-173 (Washington, D.C.: Department of the Army, 30 August 1991); *Medical Services: Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX* (Washington, D.C.: Department of the Army, 4 December 1990).

[51] Interview by author, 11 August 1995, 18 September 1995.

[52] Interview by author, 21 August 1995.

[53] Interview with Browder, 14 September 1995.

[54] Interview by author, 28 July 1995.

[55] Interview by author, 8 August 1995.

[56] Interviews by author, 28 July 1995, 30 July 1995.

Table 1: A Comparison of Physical Security at U.S. and Russian Chemical Weapons Facilities

Perimeter Security	United States[a]	Russia
Clear Zones	• Clear zones maintained 30 feet outside of the outer fence • Reinforced with steel cables to prohibit vehicle penetration of the outer fence, and, terrain permitting, speed bumps, highway barriers, or steel posts partially embedded in the ground prevent high-speed vehicle approaches	• In some cases, clear zone and patrol path evident around the perimeter; in others, outer fence adjacent to a forest or village • Clear zones reasonably well-maintained between fences, except at one site
Fencing	• Two concentric perimeter fences, seven feet high, with barbed or razor wire outriggers • Clear zones maintained between fences as well as inside inner fence	• Sites have two to four concentric rings of fencing, either chain link, barbed wire, or electrified • At one site, restricted area surrounded by a wall • Fences in disrepair at some sites
Lights	• Perimeter lights illuminate entire area inside the fences, between the fences, and the clear zone outside the outermost fence	• At two sites, perimeter lights observed, but they were few in number or appeared to be poorly maintained • No lights observed at the other sites
Gates	• A two-gate entrapment system[b] for vehicles • Armed guards check and/or inspect all personnel and vehicles entering or exiting main gate • Crash barriers installed when appropriate • Personnel use a secured separate gate; other emergency gates secured with locks and a variety of sensors to detect intrusion	• Separate gates exist for railroads, pedestrians, and road vehicles • Only main gates appeared to be guarded • Guards checked identification and issued badges • A two-gate entrapment system[b] was used at two sites, while another, inside a larger military compound had a turnstile for pedestrian entry • Railroad gates closed with a padlock
Intrusion Detection System	• Two continuous intrusion detection system lines, each with different sensing methods, installed to detect entry into the perimeter area • Sensors monitored 24 hours a day from central security control facility	• None observed
Closed-Circuit TV	• Closed-circuit TV with tamper-proof barriers allows for real-time identification of intruders	• None observed

[a] Security at U.S. facilities varies slightly from site to site, but in such cases, compensatory measures are taken. For a more detailed explanation of security at United States facilities, such as reinforced guard houses and the many other security measures required, see *Military Police: Chemical Agent Security Program*, Army Regulation 190-59 (Washington, D.C.: Department of the Army, 27 June 1994).

[b] Guards open the outer gate to allow the vehicle to enter and close it while identification checks are conducted. Only after completing this process will the guard open the inner gate.

Table 1: A Comparison of Physical Security at U.S. and Russian Chemical Weapons Facilities

Storage Buildings	United States[a]	Russia
Building Construction	• Walls either 8-inch thick reinforced concrete or reinforced cement blocks • Windows, ceilings, and roof provide resistance to penetration equal to the walls • Some storage bunkers bermed • Steel-reinforced wood or steel-reinforced metal doors constructed to prevent prying or jacking	• Some buildings constructed of cement blocks, while others made of wood • Cement-block buildings had wooden or steel doors; wooden buildings had wooden doors • Some buildings had bars on windows, some had large mesh grills • At one site, holes observed in the roof; at another, buildings had just been re-roofed
Doors: Physical Barriers and Locks	• King Tut blocks, or similar concrete barriers, placed in front of doors whenever feasible • Doors have 2 high-security padlocks • No one person possesses keys to both locks • Keys secured when not in use	• Storage building doors secured with single key padlock • Doors at one site had a bar requiring a separate key or tool to open, as well as unsecured, lift-up "dog doors" to facilitate first-entry monitoring
Intrusion Detection System	• Intrusion detection systems such as motion sensors with tamper detection devices on all openings in all storage buildings	• Intrusion detection devices (circuit-breakers) observed on doors at one site, and possibly at another • At other sites, no confirmed observation of electronic or other intruder detection sensors on entrances or other openings to storage buildings

[a] Security at U.S. facilities varies slightly from site to site, but in such cases, compensatory measures are taken. For a more detailed explanation of security at United States facilities, such as reinforced guard houses and the many other security measures required, see *Military Police: Chemical Agent Security Program*, Army Regulation 190-59 (Washington, D.C.: Department of the Army, 27 June 1994).

Moreover, the soldiers, not the officer accountable, are apparently conducting the inventory and maintenance chores. Therefore, another possibility is that with so many munitions, a number of artillery rounds could disappear before the officer in charge might notice.[57] What is not known at this point is what procedures, if any, the Russian military has for cross-checking these records. If inventory records are not routinely and randomly cross-checked by others outside the immediate unit and facility where accountability in the Russian system apparently rests, it would not be a great challenge for one or more soldiers to falsify these records. In short, theft appears to be possible if Ivan, the individual soldier, is so inclined; if a colleague and Ivan conspire; or if an outsider coopts or disables Ivan.

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[57] Interviews by author, 21 August 1995, 30 August 1995, 31 August 1995.

In contrast, accountability at U.S. storage facilities is institutionalized, collective, and computerized. U.S. storage igloos and bunkers are infrequently opened for random inventory and maintenance activities. When a soldier engages in maintenance chores or takes an inventory count, his work is double-checked and cross-checked by others to ensure its accuracy. A written planograph and computerized records are updated accordingly. These records account for the number and type of munitions in each bunker and at each storage facility. Munitions are tracked by serial number and/or production lot number. Officials at a central record keeping unit in Rock Island, Illinois, also review this data. The commanding officer here is the individual accountable for the U.S. chemical weapons inventory. Units from this central command are randomly sent to the eight storage depots in the United States to check the accuracy of these records.[58]

In all fairness, U.S. security and accountability at U.S. chemical storage facilities are not perfect. Furthermore, U.S. newspapers often describe breaches in security or acts of vandalism at U.S. regular military bases. Problems also occur with the reliability of the military personnel at sensitive U.S. facilities. The armed services do not publicize such incidents because they are embarrassing and detract from public confidence in the safety of the military bases in their midst. At U.S. chemical weapons storage sites, disgruntled soldiers—"the Timothy McVeighs of this world," as one interviewee put it—could be among the personnel. However, because of the redundancies in the U.S. physical security and in the system of accountability, a malcontent would have to recruit others in different units in order to defeat the physical security and the system of accountability. The odds of an insider successfully stealing chemical agent or munitions from a U.S. facility without being caught somewhere along the way are quite low.[59]

One must also understand that the redundancy and technical sophistication that gird the physical security and accountability at U.S. chemical weapons storage sites did not appear overnight. For instance, U.S. recordkeeping has been computerized to some extent for a long time and has gradually improved to make the records more specific. Also, it was not that long ago that rabbits were kept in U.S. storage bunkers to indicate whether the munitions within had leaked. What may be viewed as old-fashioned methods are nonetheless proven and work well.

Some of the fundamental differences in apparent Russian and U.S. security provisions are due to the nature of the respective Russian and American chemical weapons stockpiles. For instance, many U.S. chemical weapons such as the M-55 rocket are "full-up," with the explosives and propellents inside the munition. U.S. storage buildings are therefore built to withstand an explosion of high explosives and to contain the chemical agent. The explosives and propellents for Russian chemical weapons are reportedly stored apart from the part of the munition that contains the chemical agent. Since there is less inherent danger for an explosion within a Russian chemical weapons storage building, there is not a pressing safety requirement for especially sturdy storage buildings.

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[58] Interviews by author, 7 September 1995, 30 August 1995, and 31 August 1995. The arsenal at a ninth U.S. facility, on Johnston Island in the Pacific Ocean, is currently being destroyed. The one-ton bulk storage tanks present at some U.S. facilities are sealed and occasionally weighed to ascertain whether any agent is missing.

[59] Interview by author, 30 August 1995. Note that there have been numerous threats of terrorist use of chemical weapons, including one instance in 1975 where 53 canisters of the blister agent mustard were stolen from a U.S. chemical weapons storage facility in West Germany. The terrorists, probably associated with the Baader-Meinhof gang, did not carry out their threat and some, but not all of the stolen agent was recovered. In another example, a neo-Nazi skinhead group had plans in 1992 to kill children in a Dallas Jewish day-care center using cyanide. For a listing of reported threats, possession, and use of chemical agents for terrorist purposes, see Ron Purver, *Chemical and Biological Terrorism: The Threat According to the Open Literature* (Toronto: Canadian Security Intelligence Service, June 1995), 82, 84-5. See also Robin Wright, "Many Nations Seen Vulnerable to Poison Use," *Los Angeles Times*, 21 March 1995, 1.

As for some of the noticeable disparities related to accountability, the current Russian system is manpower-intensive largely because the Soviet Union could command significant human resources for a task. The officers in charge of Russia's chemical facilities are simply following precedent. The U.S. approach to accountability grew out of necessity. U.S. bunkers are tightly secured and not entered as frequently because as the U.S. stockpile aged, more leaks occurred.[60] In other words, the United States battened down the hatches and switched to a system of quarterly storage monitoring inspections and random checks initially for personnel and public safety reasons.

However, with a personalized system of accountability and minimal physical barriers, there appear to be some gaps in security at Russian facilities. Moreover, as one interviewee pointed out, the storage sites are a long way from Moscow and the borders of the former Soviet Union are becoming increasingly porous. "Sooner or later, someone will make [the soldiers at these sites] a better offer than Moscow does. If something was missing, it is likely to be an inside job."[61] With Russia's ailing economy and the limited resources now available to the Russian armed forces, the potential thus exists for insider theft and black marketeering for personal economic gain.[62] Wayward political affiliations could also be the motivating factor behind an inside theft from a Russian chemical weapons facility.

If such an incident were to occur, another concern raised was the preparedness of Russian authorities to respond. Do local military units and national authorities routinely assess the security vulnerabilities of these facilities? Do they have recovery plans and the equipment to execute them? Do they conduct training exercises to practice the recovery of chemical weapons? How quickly can Russian authorities mobilize to respond?[63] At this point, the answers to such questions are not known.

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[60] From 1983 to 1944, there were 1,862 leaks within the U.S. stockpile. U.S. Army Chemical Demilitarization and Remediation Activity, *Annual Status Report on the Disposal of Lethal Chemical Weapons and Materiel* (Department of the Army, 15 December 1994), 37.

[61] Interview by author, 28 July 1995.

[62] During a report on French television showing an image of Saratov, a reporter intoned, "You can get in here almost at will. But it ought to be one of the best guarded places in Russia, one of the six or seven storage centers for thousands of tonnes of toxic gas formerly produced by the Soviet Union....Everything leads one to believe that the least self-respecting terrorist would have no difficulty in hold of a few liters. Here everything is for sale and everything can be bought." "Official On Availability of Chemical Weapons in Russia," France-2 Television Network, 21 March 1995, FBIS Translation. Saratov is actually a military academy, where training of Russia's chemical troops occurs, not one of Russia's chemical weapons storage facilities. The equivalent in the United States is Ft. McClellan in Alabama.

Some might ask why anyone would bother to steal Russian chemical weapons when chemical agents are not that difficult to make, compared to a nuclear device. The ingredients and equipment are commercially available, and the formulas for many chemical agents are common scientific knowledge.[64] Of course, it has always been difficult to predict what disturbed workers, rebels, or terrorists will do, but those who want to inflict the most serious harm may seek military-strength chemical agent. Terrorists may be able to concoct a chemical agent, but it as not as easy as some might believe to make highly effective chemical agent. For instance, evidence indicates Aum Shinrikyo's chemists were unsuccessful in their attempts to manufacture high-grade sarin.[65] Their failure ultimately saved the lives of thousands who were in the Tokyo subway last March 20th.

Another factor to consider is that chemical weapons are easier to use than nuclear weapons. With chemical weapons, thieves do not have to overcome the security devices or Permissive Action Links (PALs) that are often placed on individual nuclear weapons. Nor do they have to figure out the launch codes and sequences that are likely to frustrate an attempt to use a stolen nuclear weapon. Instead, the would-be users of chemical weapons purchased on the black market or stolen from a facility can shield themselves with protective clothing and gas masks that are commercially available. If they have artillery guns or aircraft, they have the option to use chemical munitions as is or to drain them and fashion their own crude delivery system.[66] "Once stolen, a chemical weapon is far easier for a terrorist or rebel military group to use than a nuclear weapon."[67] Moreover, the use of poison gas is not perceived as being as heinous as the use of nuclear weapons.[68]

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[63] Interview by author, 31 August 1995. In a related readiness issue, Browder noted that the preparedness of Russian soldiers to respond to an accident or incident with chemical weapons appeared to be meager. Interview with Browder, 14 September 1995. Noting that the fire-fighting equipment within the restricted area consisted of axes, sand-filled buckets, and buckets for bailing water, another interviewee described their "ability to respond to fire or security threats was marginal to nonexistent." Interview by author, 18 September 1995. All U.S. storage facilities conduct routine vulnerability assessments and have plans and drills to practice a response to locate and recover stolen munitions. *Chemical Agent Security Program*, 22, 31-32.

[64] Many of the same chemicals that can be used to produce pharmaceuticals, textile dyes, and pesticides can also be used to make chemical agents. For this reason, the Chemical Weapons Convention contains unprecedented verification provisions that control such "precursor" chemicals and require reporting and inspection within the commercial chemical industry. While such procedures will help international inspectors track and assess commercial activities with dual-use chemicals, the ingredients, equipment, and know-how to make chemical weapons will be on the open market indefinitely.

[65] Interview with Kyle Olson, Washington, D.C., 14 September 1995. Olson is writing a book about the recent events in Japan.

[66] The Aum Shinrikyo cult executed its attack on Tokyo's subway by placing low-grade sarin in two-ply plastic bags and using umbrellas or other sharp objects to puncture these bags quickly before exiting the subway cars. Unsuspecting passengers left on those cars were quickly overcome with fumes, which also made their way into the subway stations when the effected trains stopped to release passengers. Interview with Olson, 14 September 1995. Olson also observed that Russian chemical weapons are comparatively safe to transport since the high-explosive component reportedly is stored separately from the chemical munition.

When asked to assess the threat of Russian nuclear weapons being stolen versus the possibility of Russian chemical weapons theft, one interviewee viewed the threat as "very much the same."[69] Others interviewed differed with this opinion. They believed that Russia's chemical arsenal presents a far more exposed and appealing target for potential thieves or attackers.[70]

Although security apparently varies from facility to facility, security at Russian nuclear facilities was described as generally better than the security observed at Russian chemical weapons storage sites. Russian nuclear facilities have redundant perimeter fences; steel doors on storage buildings; electronic sensors; and serial numbers, seals, and PALs on warheads, which have accompanying containers that each have their own "passport" control documents. Using a 1 to 10 scale, with 10 being the highest grade of security, one interviewee rated U.S. nuclear security a 9.9, Russian nuclear security an 8, U.S. chemical weapons security a 9+, and Russian chemical weapons security a 3.[71] From another individual, the security of Russian chemical weapons also received a rating of 3, while security at U.S. storage sites was rated from 8 to 10, depending upon the facility.[72]

Finally, U.S. policy makers should also be cognizant of the gradual disintegration that has taken place throughout Russia's complex of research, production, and storage facilities. The effects of economic hardship show not only in the apparent differences in physical security and maintenance observed from one storage facility to another. Hundreds of chemical weapons experts are out of work. With less and less cohesion among this research community, the temptation for these experts to sell their knowledge to the highest bidder will increase if they cannot find more productive and peaceful ways to support themselves and their families. Unlike nuclear development programs, where a relatively small number of people know all of the crucial information about making a nuclear weapon, the knowledge threshold for chemical weapons is not nearly as high. A larger number of Russian chemical weapons specialists know enough to benefit greatly the efforts of would-be chemical weapons proliferators.[73]

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[67] Interview by author, 30 August 1995.

[68] Throughout history, warring parties have resorted to chemical weapons more frequently than nuclear weapons, which the United States used twice against Japan at the end of World War II. Chemical weapons were a hallmark of World War I and the 1980s Iran-Iraq War. China and Abyssinia also suffered chemical attacks during World War II. For more on the history of chemical weapons use, see Edward M. Spiers, *Chemical Weaponry. A Continuing Challenge* (New York: St. Martin's Press, 1989).

[69] Interview by author, 28 July 1995.

[70] Interviews by author, 30 August 1995 and 31 August 1995.

[71] This individual had been to numerous Russian nuclear facilities and had in-depth knowledge of Russian chemical weapons storage facilities. Interview by author, 30 August 1995.

[72] Interview by author, 18 September 1995.

[73] Interview by author, 8 August 1995. For more on the different technology thresholds underlying nuclear and chemical weapons, see U.S. Congress, Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction* (Washington, D.C.: U.S. Government Printing Office, December 1993). On chemical weapons proliferation, see U.S. Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction* (Washington, D.C.: U.S.

Observations and Recommendations

From outward appearances, Russia's chemical weapons storage sites appear to be vulnerable to theft from within and attack from without. In all candor, many American homes have more sophisticated physical security than was observed at some Russian chemical weapons storage sites. For about $200, sometimes less, U.S. citizens can have motion sensors, door and window contacts, and alarms installed and monitored 24 hours a day for an additional $22 monthly fee. Alarms bring private security or local police to the scene.[74]

Failure to improve the security at Russian chemical weapons storage facilities increases the odds that chemical agent of Russian origin will find its way onto the black market and into an ethnic conflict, subway system, or building somewhere. Innocent civilians will suffer the repercussions.

Again, the Russian government appears to have recognized the security at these sites as an issue in need of attention. Col. Gen. Stanislav Petrov, the commander of the Radiation, Chemical, and Biological Defense Troops, has requested additional funding to upgrade security at Russia's chemical weapons storage facilities since the locations have become a matter of public knowledge. Worried that this disclosure might fuel the worsening crime situation in Russia, Petrov noted that his already strained budget has been stretched even further by a Ministry of Defense effort to increase guard duty, upgrade the effectiveness of "engineering protection, and carry out vigilance exercises" at chemical weapons storage sites.[75] With few rubles available, the Kremlin must balance requests for improved security against domestic concerns about the environmental safety of Russia's chemical weapons stockpile, especially the blister agents at Gorny and Kambarka, and proposals to upgrade safety at chemical sites at an estimated cost of 21.6 billion rubles.[76] If environmental concerns are not addressed, it may be more difficult for the Russian government to persuade local communities to cooperate with the program to destroy the Russian chemical arsenal. For a government being pressed to keep its treaty commitments to eliminate its chemical stockpile, the choice is a difficult one.

While the CTR program was initiated to address the safety and security of all weapons of mass destruction in the former Soviet Union, the overwhelming majority of the Nunn-Lugar funds have gone toward nuclear security and disarmament. This focus on nuclear safety, security, and dismantlement was appropriately geared to the problems recognized at the time. To date, $55 million or roughly five percent of the over $1 billion in CTR funds has gone toward assisting the chemical weapons destruction program in Russia.

Government Printing Office, December 1993); Gordon M. Burck and Charles C. Flowerree, *International Handbook on Chemical Weapons Proliferation* (New York: Federation of American Scientists and Greenwood Press, 1991); U.S. House of Representatives, Committee on Armed Services, *Countering the Chemical and Biological Weapons Threat in the Post-Soviet World*, 102d Cong., 2d sess., Committee Print No. 15 (Washington, D.C.: U.S. Government Printing Office, 1993).

[74] This information reflects prices and services quoted by two home security companies, ADT and Brinks, on 30 August 1995. More elaborate systems are available.

[75] Anatoliy Yurkin, "General Urges More Funds for Guarding Chemical Weapons," ITAR-TASS, 2 August 1995, FBIS Translation.

[76] "Over R509 Billion Needed to Destroy Chemical Weapons," *Novosti*, Moscow, 1 August 1995, FBIS Translation.

For a rather modest amount, the United States could help Russia markedly enhance security at these sites. Perimeter security could be strengthened to allow guards to detect and respond to intruders more rapidly. Lights and closed-circuit TV could be added. Physical security at individual buildings could be reinforced with better doors, locks, and King Tut blocks. More advanced seals would also appear to be in order. Such low-tech improvements will be less expensive and easier for the Russians to operate and maintain.

The United States might also consider providing early warning monitors or intruder detection systems for heightened perimeter and storage building security. Another option would be to furnish computers so central inventory records could be maintained in a computerized database. To address the problem of "brain drain" of Russia's chemical weapons expertise, the United States might set up employment and aid projects under the umbrella of the CTR program, similar to those set up for Russia's nuclear experts.

In addition, U.S. officials might also constructively engage Russian authorities in a dialogue about response and recovery procedures to be used in the event of an attack or theft of chemical weapons. The U.S. Army routinely conducts vulnerability assessments of U.S. storage facilities. Response plans are tailored to each site and troops train and practice drills to test them and ensure readiness in the event of an actual theft or attack.[77] Such capabilities and experience would be well worth sharing with Russian authorities.

In the midst of a struggle to bring federal spending under control, Congress correctly has its sights focused on improving government services to U.S. citizens at the lowest practicable cost. Such an intense focus on domestic matters can often result, however, in proposals that win points with the voters but in the end weaken U.S. national security. For example, some in Congress have called for cuts in the CTR program as a whole.[78] Others in Congress have proposed reducing funds for assistance to Russia's chemical weapons destruction program or have sought to portray certain CTR programs, such as those geared toward conversion of defense facilities, as ill-conceived. Such proposals are short-sighted.

The CTR program is an astute investment in U.S. and international security. U.S. security interests are being well served by aiding the security and dismantlement of former Soviet nuclear weapons, and funds should not be diverted from the important tasks that the CTR has underway in order to attend to security at Russian chemical weapons storage facilities.

The measures recommended above could yield substantial improvements in the security of Russia's chemical weapons stockpile, and exorbitant sums would not be required to enact them. Given the line crossed by Aum Shinrikyo and the political and economic circumstances in the former Soviet Union, the U.S. Senate would be prudent to set aside additional funds for assistance to reinforce security at these sites. The price of assisting Russia now is much lower than the cost that may be incurred later if this problem is not promptly addressed.

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[77] *Military Police: Chemical Agent Security Program*, Army Regulation 190-59, 22, 25, 31-33.

[78] For fiscal year 1996, the Clinton administration requested $731 million for the CTR program. The House of Representatives cut this request by $171 million, the Senate by $6 million. As of this writing, House and Senate conferees had not arrived at a final decision about CTR funding.

Dismantling the Soviet/Russian Chemical Weapons Complex: An Insider's View

Dr. Vil S. Mirzayanov

The following pages tell of my personal journey and of a chemical weapons development program that went unchecked. While many people are aware of some of the details associated with this story, they do not know that I am a stalwart supporter of the Chemical Weapons Convention (CWC) as the most viable way to bring this particular program or, for that matter, any other runaway chemical weapons development program, under control. Without the CWC, I fear such programs will continue to endanger mankind.

In the last year, the ratification of the CWC has been under consideration in the U.S. Senate and the Russian Duma. Differing views about ratification exist in both countries, so politics will undoubtedly influence their actions. Given the consequences of this important decision, American and Russian legislators and citizens should do their utmost to set politics aside in this instance. U.S. and Russian decisions about the CWC's ratification will mean either the fruitful entry into force of a crucial disarmament and nonproliferation treaty or the beginning of its gradual disintegration.

If the United States does not ratify the CWC, pushing Russia to do the same, Russia's chemical weapons programs will become less transparent, perhaps even completely closed. Although there is no organized political force in Russia opposing the CWC's ratification, some within the military and political ranks would like to revise the CWC. Their aim is to exclude the CWC's provisions that ban the development and testing of chemical weapons. These misguided people believe that military weapons, including chemical weapons, are the key to Russia's ability to remain a strong and respected country.[1]

While such views are cause for apprehension, one must recognize that these individuals are poorly informed about the subject of chemical weapons and are clinging to old ways of thinking about how security can best be achieved. Initially, I too objected to the CWC, which I assessed as being inadequate for the task of eliminating chemical weapons. My lack of understanding about the CWC's provisions and my naivete about politics in general led me to advise against ratification of the CWC in a 24 March 1994 speech to the Duma and in articles published in Russia and in the West.[2]

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[1] For example, a colonel of the General Staff of the Russian Armed Forces made remarks to that effect before a closed meeting of the Committee on Defense of the State Duma on 11 October 1994. Konstantin Kupreev, one high-ranking official of the Duma's Committee on International Affairs, has also expressed similar sentiments in a 9 February 1995 conversation with me.

[2] "Free to Develop Chemical Weapons," Vil Mirzayanov, *The Wall Street Journal*, 25 May 1994, p. A16; "Chemical Weapons: An Expose," Vil Mirzayanov, *Perspective*, vol. IV, no. 4, Institute for the Study of Conflict, Ideology & Policy, Boston University, April-May 1994, 1-4.

The Duma has held preparatory hearings on the CWC, despite my imprudent counsel, the rumblings of the ultra-nationalists, and the fact that President Boris Yeltsin has not yet transferred the CWC to the Duma for formal consideration. In fact, the Duma Committee on Defense has stated its general approval of the CWC. This committee found that Russia's signature of the CWC:

> conforms with the new foreign policy of Russia....Chemical disarmament meets in full measure the national interests of Russia since it provides for the destruction of obsolete stocks of chemical weapons that present a real danger to the population and to the environment. Destruction of chemical weapons will not affect national security and will have no impact on the defense capability of the country. Ratification of the Convention should be regarded as part of the overall process of disarmament.[3]

In addition to such statements, the Defense Committee has urged the Russian government to proceed promptly with the planning and other activities that will enable Russia to implement the CWC.

Such encouraging developments should not be mistaken as signs that Russia will move forward with the CWC before the United States does. I am certain that if the U.S. Senate does not consent to ratify the treaty, the Russian Duma surely will not approve it. As already noted, this scenario would probably doom the CWC to failure.

The Evolution of My Views

For some, such views are a notable departure from what I have said before and what they expected to hear from a veteran of the Soviet chemical weapons complex. Many people think that they know my story—what I have done and why I did it—but, given the rumors and confusion swirling around me, perhaps it is best that I tell it myself.

For twenty-six years, I worked at the State Scientific Research Institute of Organic Chemistry and Technology (GosNIIOKhT) in the heart of Moscow.[4] I began as a scientist working in a laboratory with sophisticated equipment to monitor the air, water, and other emissions from this facility. In my final position at GosNIIOKhT, I was the Chief of the Department of Counteraction against Foreign Technical Intelligence. For much of my career, my duties involved the security of all new projects at GosNIIOKhT and the chemical weapons complex as a whole. Accordingly, I strived to ensure that this work would go undetected by foreign intelligence services. I had state-of-the-art equipment at my disposal, and my job offered me unique opportunities for creative scientific work. My years at GosNIIOKhT were the most rewarding of my scientific career.

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[3] 11 October 1994 Resolution of the Committee on Defense, State Duma of the Federal Assembly of the Russian Federation, "On the Course of Preparation of the Russian Federation for the Process of Destruction of Chemical Weapons and for Ratification of the 'Convention on Prohibition of Development, Production, Stockpiling and Use of Chemical Weapons and On Their Destruction'," 2-3.

[4] GosNIIOKhT actually had four branches. The Moscow branch, which employed 500-600 scientists and a total of about 3,500 people, was the largest. The Volgograd branch specialized in research on soman and new binary agents, while the Shikhany branch worked on the synthesis and testing of new agents. A fourth branch was located at Novocheboksarsk, along with a large chemical weapons production facility.

I was somewhat surprised to discover, however, the extent to which our efforts to protect these programs succeeded. When I first went public with statements about the development of new chemical agents in October 1991, I was stunned to learn that U.S. Government officials really did not appear to know what was going on inside the Soviet and later the Russian chemical weapons complex.

I unmasked the policies and activities of the Soviet/Russian chemical weapons complex for several reasons. First, I witnessed the duplicity of Soviet officials during the CWC negotiations. Although the United States stopped producing and testing chemical weapons and signed an agreement with the Soviet Union to that effect in June 1990, the USSR did not stop such work.[5] The main reason that the Soviets did not stop their developmental work is that the United States had succeeded in developing, testing, and producing a binary chemical weapon.[6] GosNIIOKhT's leadership was compelled to pursue an analogous capability—a Soviet binary.

In other words, the USSR intensified the development and testing of the most modern class of chemical weapons during the final stages of the CWC's negotiations. These events took place during the period of "perestroika," when Moscow was doing its utmost to demonstrate its peaceful intentions, welcoming new arms control proposals and loosening its iron grip over Eastern European satellite states. For many Soviets, however, perestroika meant a lack of food, clothing, and housing. The USSR was asking for foreign loans to make ends meet. For me, this was a hypocrisy of the greatest order: Internationally, the Soviet government pretended to have stopped producing chemical weapons, while domestically it funded a program to develop those very weapons at the expense of its own citizens.

At about this time, the top officials ordered the escalation of a program known by the secret codename "novichok," which in Russian means newcomer. This research resulted in a new class of Soviet binary chemical weapons.

The Soviets actually began their research program to develop a new generation of chemical agents back in the mid-1970s. In 1978, they completed construction of a large facility in Novocheboksarsk that had the capacity to make up to 20,000 tons of chemical agents annually.[7] The Novocheboksarsk facility would later produce a total of about 15,000 tons of a chemical agent called Substance 33, which is similar to the nerve agent VX. The Soviet Army gave its official approval to a new unitary chemical agent known as A-230 in 1988. Yet a third new unitary agent called A-232, which was similar to agent A-230, was also developed but never received the Soviet Army's approval. Testing of these new agents took place at Shikhany and in Nukus, Uzbekistan. These agents were produced only in limited "experimental" quantities.

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[5] In the U.S.-Soviet Bilateral Destruction Agreement, both states agreed to stop producing chemical weapons and to reduce their respective chemical weapons stockpile to no more than 5,000 metric tons. These reductions were to have been finished by 31 December 2002, but the revised date has the bilateral destruction process beginning by 30 June 1997 and ending by 30 June 2004. This treaty has not yet entered into force and has verification procedures similar to those in the CWC.

[6] In a binary chemical weapon, the two component chemicals are mixed just prior to the weapon's arming or detonation to create a lethal agent. In unitary chemical weapons, such as the nerve gases VX, tabun, soman, and sarin, the chemicals are combined during the manufacturing process so that the agent is at its full potency from the outset. Binary weapons are considered safer since the components can be stored separately. The United States halted production of its binary, called the Bigeye, in 1990.

[7] This facility is very large, but as far as I know, it has never actually operated at its full capacity.

These three agents—Substance 33, A-230, and A-232—were the springboard for the development and testing of the novichok binary weapons. The first novichok agent to receive Soviet Army approval was novichok-5, which under optimal conditions exceeds the effectiveness of VX by five to eight times. Novichok-5, which was based upon A-232, was developed by GosNIIOKhT's scientists and tested in 1989 and 1990 at a large facility in Nukus. The binary variant of Substance 33, which was tested at Nukus and Shikhany, was officially adopted by the Soviet Army as a chemical weapon in 1990. The developments associated with the novichok program are presented in Table 2.

These achievements—in particular the success of the binary based upon Substance 33—were celebrated in 1991 by the most senior officials in the USSR. President Mikhail Gorbachev presented the Soviet Union's highest award, the Lenin Prize, to GosNIIOKhT's Director, Victor Petrunin, the Vice-Commander of the Soviet Chemical Forces Gen. Anatoly Kuntsevich, and his successor, Gen. Igor Yevstavyev.

One should be mindful that the chemical components or precursors of A-232 and its binary version novichok-5 are ordinary organophosphates that can be made at commercial chemical companies that manufacture such products as fertilizers and pesticides. In my opinion, this research program was premised on the ability to hide the production of precursor chemicals under the guise of legitimate commercial chemical production of agricultural chemicals. Inspectors would have a difficult time uncovering this covert Soviet chemical weapons production program since no outsiders knew that these new chemical agents even existed.[8] To me, this situation was ominous: It could have been the basis for undermining the verification regime being shaped in the Geneva negotiations.

Furthermore, neither the Soviets nor the Russians revealed any of these activities under the terms of a bilateral Memorandum of Understanding that was designed to promote mutual transparency of chemical weapons programs and to test proposed verification procedures.[9] Even worse, although the June 1990 Bilateral Destruction Agreement had not been approved by either country and therefore had not entered into force, the continued testing and production of chemical agents by the Soviet and Russian governments amounted to a grave violation of that agreement.

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[8] The CWC bans known chemical agents and specifies them by name on Schedule 1. The CWC catalogs the other chemicals that it controls -- mostly the precursors to agents -- on Schedules 2 and 3. *Variants* of the chemicals involved in the binary program are currently on these Schedules, but the individual chemicals themselves are not specified by name.

[9] The Wyoming Memorandum of Understanding, signed on 23 September 1989, provided for both countries to engage in a voluntary, cooperative program of data exchanges and trial verification experiments. The first data exchange took place at the end 1989, the second early in 1994. Each side conducted seven trial inspections in conjunction with the first data exchange and five following the second.

Table 2: Mirzayanov's Account of the Novichok Program

Name of Agent	Type of Agent	Research Program	Test Site	Production Site	Status
Substance 33	• Unitary agent • Similar to nerve agent VX • Novichok precursor	Site: GosNIIOKhT (Moscow)	Shikhany	Novocheboksarsk	• 15,000 tons produced • Declared as VX under terms of Wyoming MOU[a]
A-230	• Unitary agent • Novichok precursor	Site: GosNIIOKhT (Shikhany) Lead Researcher: Pyotr Kirpichov	Nukus	Shikhany and Volgograd	• Tested 1988-1989 • Adopted as chemical weapon 1990 • Experimental quantities produced (tens of tons)
A-232	• Unitary agent • Similar to A-230 • Novichok precursor	Site: GosNIIOKhT (Shikhany) Lead Developer: Pyotr Kirpichov	Nukus and Shikhany	Shikhany and Volgograd	• Experimental quantities produced (a few tons) • Not approved by the Army
Novichok-5[*]	• Binary agent • Based on A-232 • 5-8 times more effective than VX	Site: GosNIIOKhT (Moscow) Lead Developers: Igor Vasiliev and Andrei Zheleznyakov[b]	Nukus	Shikhany and Volgograd	• Tested 1989-1990 • Experimental quantities produced (a few tons) • Approved as chemical weapon 1989
Novichok-#? No established name	• Binary agent • Based on Substance 33	Site: GosNIIKOhT (Moscow and Shikhany)	Nukus and Shikhany	Novocheboksarsk and Shikhany	• Tested 1988-1989 • Adopted as chemical weapon 1990 • Experimental quantities produced (tens of tons)
Novichok-7[c]	• Binary agent • 10 times more effective than similar nerve agent soman	Site: GosNIIOKhT (Moscow) Lead Developer: George Drozd	Shikhany	Shikhany	• Tested 1993 • Experimental quantities produced (tens of tons)

[a] The 1989 Wyoming Memorandum of Understanding is a bilateral confidence-building agreement signed by the United States and the USSR, providing for reciprocal data exchanges and trial on-site inspections.

[b] Andrei Zheleznyakov was mortally wounded in a laboratory accident during the development of novichok-5.

[c] The number of the novichok agent does not necessarily mean that other novichok agents, either numerically before or after this agent, exist.

I had hoped that this pattern of behavior would change as new democratic norms and institutions took hold in Russia. At first, it looked as though this would happen. Yeltsin made several statements about the importance of keeping arms control commitments made by the Soviet Union and of destroying our inherited chemical weapons stockpile safely. He also formed a new Presidential Committee on Biological and Chemical Weapons to oversee the dismantlement of these military complexes and weapons in accordance with treaty provisions. Yeltsin erred by appointing the same group of officials who had run the chemical weapons complex under the Soviet system to this important committee. Kuntsevich, for example, chaired the presidential committee. After a while, I realized that behavior patterns were not changing and the level of my protests gradually increased.

The first overt signs of my disillusionment with this situation came in 1989 when I helped to organize a branch of the Democratic Movement of Russia within GosNIIOKhT. In May 1990, I ended my membership in the Communist Party. Thereafter, the authorities denied me access to my laboratory equipment and several of my closest colleagues were transferred elsewhere. In short, they began to try to isolate me.

Next, on 10 October 1991, I published an article in the newspaper *Kuranty* wherein I attempted to draw public attention to the dangerous and deceiving policies of the chemical weapons complex.[10] This article was a *cri de coeur*, a cry from my heart. To my dismay, few inside Russia and even fewer abroad paid any attention to my warnings. More dramatic events associated with the USSR's disintegration overshadowed my revelations about the development of new chemical agents. I tried personally to persuade the leaders of the Democratic Movement of Russia that the chemical weapons complex would continue this dangerous activity if its leaders were not confronted. GosNIIOKhT, I noted, was conducting hazardous work that grossly violated ecological standards and threatened the safety of hundreds of thousands of Muscovites. Even when I told them that the storage facilities at GosNIIOKhT contained enough chemical agents for a second Chernobyl, my warnings went unheeded.

The only ones paying attention to my actions were the leaders of the chemical weapons complex, who fired me on 6 January 1992.[11] Because of a legal technicality, I was not arrested at that time, but I was forced to eke out a living by selling goods at Moscow's flea market. During chance encounters with my former GosNIIOKhT colleagues, I learned that the same policies and practices that I had spoken out against were still being pursued. I was angered, but not surprised, to learn that GosNIIOKhT's employees had spent an entire year falsifying technical documents about the work done at Novocheboksarsk. They were scrambling to create proof for international inspectors that the Novocheboksarsk facility was producing the agent VX, when in fact it was producing Substance 33, the VX-like agent.[12]

These circumstances, among others, convinced me that I had to raise the level of my protests. On 16 September 1992, I co-authored an article with Lev Fyodorov that appeared in the

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[10] This article is titled "Inversion."

[11] To show how little had changed since the collapse of the USSR, I was fired according to Stalinist custom, after open general meetings of the various departments of GosNIIOKhT wherein people expressed their opinions and demanded my punishment.

[12] The Novocheboksarsk facility may have also been producing the binary that is based upon Substance 33.

Moscow News, a weekly publication. I also gave interviews to Western and Russian reporters wherein I stated my grave concerns about the direction of the Russian chemical weapons program.[13] This time, the Russian Federal Counterintelligence Service (FCS), formerly the KGB, did not look the other way. On 22 October 1992, I was arrested and imprisoned in Lefortovo, the infamous KGB prison in downtown Moscow. I was charged with revealing state secrets, although anyone who reads my articles or other public statements can see that I have been careful not to disclose technical details about the program.[14]

The authorities found no secret information in my possession, despite a thorough search of my apartment.[15] After eleven days in jail without access to my defense attorney, I was released on the condition that I not leave Moscow. What became clear was that those prosecuting me were less concerned with protecting state secrets than with making an example of me. To wit, as I prepared my defense, I was legally allowed to copy numerous top secret documents—many of which I had never seen before—and distribute them to my attorney, the press, and others abroad who were denouncing my persecution.

A dispute with Nicolai Sazanov, the judge who had jurisdiction over my case, resulted in my being imprisoned a second time. In this instance, I went to jail because I protested Sazanov's refusal of my request to declare the list of unpublished states secrets illegal.[16] As my case wound its way through the Russian legal system, it garnered a great deal of international attention.[17] Had it not been for the protests of numerous scientific and human rights organizations in the United States, Germany, Great Britain, Holland, Canada, Italy, Sweden, and elsewhere, I have no doubt that I would still be in prison. After more than three weeks in jail,

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[13] See Will Englund, "Ex-Soviet Scientists Says Gorbachev's Regime Created New Nerve Gas in '91," *The Baltimore Sun*, 16 September 1992, A3; Will Englund, "Russia Still Doing Secret Work on Chemical Arms," *The Baltimore Sun*, 18 October 1992, A1; and Oleg Vishnyakov, "Backstage Story: Binary Bomb Exploded. First Victim Arrested by State Security. Can a State Crime Be a Departmental Secret? Chemical Weapons Are Banned, But Is the Military Continuing With Chemistry?" *Novoye Vremya*, 22 October 1992, 4-9.

[14] These charges were based on a resolution of GosNIIOKhT's Permanent Technical Commission. One member of this commission, Professor Georgi Drozd, judged these charges to be unfounded and refused to sign the resolution. At one meeting of the commission, Drozd recalled that GosNIIOKhT's Deputy Director, Alexander Martynov, who was also a colonel in the FCS, told the group that I would never be freed and therefore there was not much need for proof of the charges being brought against me.

[15] More than fifty top secret documents, many of which had not previously been in my possession, somehow appeared among my files at work. For example, though I had never officially had access to the project that developed and tested the novichok-5 agent, one document detailed my technical assignment to this program. The record of the list of the individuals admitted to this project shows that I never took part in this work.

[16] This unpublished list was the basis for the charges against me, yet the judge refused to allow me and my attorney access to this list. His ruling was in direct violation of Paragraph 3, Article 15 of the Russian Constitution. When I argued that at least I was not guilty of the crime of violating the Constitution, on 27 January 1994 I was arrested again. This time, I was treated as a dangerous criminal, hand-cuffed and escorted by dogs. See Sonni Efron, "Russian Whistle-Blower Calls Closed Trial 'a Crime'," *The Los Angeles Times*, 26 January 1994, A12.

[17] Among the many articles written about my plight were Serge Schmemann, "K.G.B.'s Successor Charges Scientist," *The New York Times*, 1 November 1992, A4; Gale Colby, "Fabricating Guilt," *The Bulletin of the Atomic Scientists*, vol. 49, no. 8, October 1993, 12-13; Sonni Efron, "Russian Scientist Faces Trial for Chemical-Arms Report," *The Los Angeles Times*, 5 January 1994, A6; Fred Hiatt, "Russian Court Opens Unprecedented Secrets Trial," *The Washington Post*, 25 January 1994, A1.

I was released on 22 February 1994. Then, on 11 March 1994, acting Prosecutor-General A. Ilyushenko closed my case due to "absence of evidence of the crime."

My attorney advised me to press for further resolution of my case in order to set a legal precedent. In all likelihood, the case would have gone all the way to the Russian Supreme Court and could have helped to propel legal and civil progress in Russia. As the father of two young sons, I could not in good conscious pursue this matter, even though President Yeltsin promised me amnesty if the decision was unfavorable.[18] Furthermore, I did not wish to continue with this ordeal since I had committed no crime. My innocence was underscored when the People's Court of Moscow's Perovsky district ordered GosNIIOKhT and the federal Prosecutor-General's Office to pay me thirty million rubles for financial and moral damages.[19] I have yet, however, to receive any compensation, and GosNIIOKhT has filed a countersuit against me for moral and financial damages in the amount of 33 million rubles.

Amidst all of this legal maneuvering, things did not stand still within the chemical weapons complex. In the Fall of 1993—months after Russia signed the CWC—Professor Georgi Drozd successfully completed testing the binary novichok-7 at the Shikhany test site. Novichok-7 is approximately ten times more effective than soman but has similar volatility. While the program was in full operation, so-called "experimental" quantities of these new agents were produced for testing purposes. The quantity of these new agents that was produced—a few tens of tons, at most—is not significant in the military sense.[20] Two experimental production facilities were built at Shikhany and Volgograd, but full-scale production facilities, like the one built at Novocheboksarsk for Substance 33, were not built for any of the new agents. Moreover, there is very little chance that Russia will further develop or produce any of the new chemical agents. Russia's continuing economic crisis means that the government can simply no longer afford to fund these programs at their previous high levels.

Though I have not worked at GosNIIOKhT since January 1992, I have remained in contact with several colleagues who are still employed within the chemical weapons complex. These individuals tell me that the signs of deterioration within this program are evident—approximately fifty percent of the scientific personnel in the research and development institutes like GosNIIOKhT have been laid off from their jobs. As many as ninety percent of those involved with producing chemical agents lost their jobs when production stopped.

Furthermore, Yeltsin fired Kuntsevich on 7 April 1994 from his position as the chairman of the President's Committee on Biological and Chemical Weapons. Little, if anything, has improved since Kuntsevich's departure. Pavel Pavlovitch Syutkin, previously Kuntsevich's deputy, now heads the committee. Syutkin, however, is no more competent or motivated to oversee the dismantlement of the chemical weapons complex than his former boss.

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[18] In 1993, one of Yeltsin's closest advisors made a verbal promise to me to this effect.

[19] Fred Hiatt, "Russian Court Rules Against Government," *The Washington Post*, 9 June 1994, A22.

[20] While a very small amount of agent can have a devastating effect on unprotected civilians, a few tens of tons of chemical agent is not necessarily significant in the tactical or strategic sense for a military attack, especially against a well-equipped and trained opponent. For example, to contaminate a parcel of land 72 square kilometers in size, 21.2 metric tons of the nerve agent VX would have to be dispersed twice a day, meaning over 43 metric tons would be required daily for this one area. Or, to achieve 50 percent contamination of 1 square kilometer of ground using mustard gas, over 134 metric tons of mustard gas would need to be dispersed per day. See Victor A. Utgoff, *The Challenge of Chemical Weapons: An American Perspective* (New York: St. Martin's Press, 1991), 238, 240.

The Dangers of Chemical Weapons

Nuclear weapons were used only on two Japanese cities at the end of World War II. In comparison, chemical weapons were used often on World War I battlefields and as recently in the 1980s Iran-Iraq War, when helpless citizens were sometimes the targets of chemical attacks. Nuclear weapons demolish everything in the vicinity of the explosion, but chemical weapons, perhaps even more insidiously, kill or injure the living, leaving buildings standing. Still, for some reason, chemical weapons are thought of as old-fashioned and are not perceived as being as abhorrent as nuclear weapons.

Chemical weapons are not useful strategically and are of marginal use tactically, especially against well-equipped and trained troops. However, chemical weapons are quite effective against an unprotected civilian population.[21] What would the reaction have been, for example, had Saddam Hussein used chemical weapons against Israeli citizens?[22] More recently, Japanese citizens have been the victims of indiscriminate poison gas attacks in the subways of Tokyo and Yokohama.[23] These events have not only shaken the entire country of Japan, they have provided a high-profile example of the utility of chemical weapons for terrorist purposes.

Accordingly, it is more important than ever that we proceed with the safe destruction of existing chemical weapons stockpiles. Nowhere is the need to attend to this matter more evident than in Russia, where the Duma's Committee on Defense has classified "the condition of [Russia's chemical weapons] storage facilities and of most chemical warfare products" as an "emergency or near-emergency." According to this committee, "By the expected time of the actual start of the process of chemical weapons destruction, that is by 2003-2007, all facilities and all types of products will be in a state of emergency."[24]

Security and accounting procedures within Russia's chemical complex can be described as primitive, at best.[25] Though there are fences and guards at these facilities, such factors are no hindrance to desperate individuals who will do anything to make money. Given the instability and corruption that permeate contemporary Russia, one cannot rule out the possibility that some will seek to profit by smuggling out chemical weapons for sale on the black market, as others have tried to do with nuclear materials.

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[21] Even a few molecules of poison gas may be enough to produce unpredictable genetic changes that can manifest themselves through several generations. See Valentin Tarasov and Ludmilla Kalinina, "Principles of Assessing Mutagenic and Carcinogenic Danger of Poison Gas and of Products of Their Degradation and Biotransformation," Paper presented at the NATO International Conference on Chemical Weapons, Kaliningrad, February 1995.

[22] In the aftermath of the Persian Gulf War, inspectors from the United Nations Special Commission found that, in addition to bombs and missiles filled with mustard gas and the nerve agents tabun and sarin, Iraq had loaded 14 Al-Hussein missiles with binary agent warheads. Another 336 bombs were filled with binary agent. *Chemical Weapons Convention Bulletin*, no. 13, September 1991, 22.

[23] The Tokyo attack took place on 20 March 1995, killing 12 and injuring 5,500. The Yokohama attack on 19 April 1995 sent over 250 to the hospital.

[24] See the 11 October 1994 Resolution of the Committee on Defense, op cit., 4.

[25] Russian officials cannot precisely account for how much chemical agent was made or how many weapons have been transferred from one location to another. In a closed meeting of the Duma Defense Committee on 11 October 1994, A.S. Obukhov, the General Director of Scientific Production Association "Basalt" admitted that with approximately four million Russian chemical munitions having been produced, it was virtually impossible to keep track of this arsenal in

In short, I fear that the danger of chemical weapons proliferation or theft far exceeds the danger of foul play with the nuclear arsenal of the former Soviet Union. I strongly recommend that security at these storage sites be improved and the appropriate steps taken to prevent these weapons from falling into the wrong hands.

Russia's stockpile is also a ticking ecological time bomb. Soviet officials amply demonstrated their disregard for public safety by callously operating chemical weapons production facilities with little protection for the health of the facilities' workers, neighbors, and the surrounding environment. After some time at GosNIIOKhT, I realized that basic safety standards were routinely being violated, that workers were frequently being contaminated with chemical agents while on the job.[26] Top-ranking officials within the military-chemical complex were aware of these circumstances, but did not take measures to upgrade safety. It should be of little surprise, therefore, that citizens greeted their government's plans to destroy the chemical weapons stockpile with skepticism and fear.[27]

Their apprehensions appear to have been well-founded. The top officials in the chemical weapons complex tried to destroy surreptitiously the new binary agents that had been produced. From 1993 to 1994, they destroyed this material by detonating the binaries in the open air at the Shikhany test site, near the city of Saratov. Since they used no safety precautions whatsoever—simply exploding the binary shells and allowing the wind to carry away their poisonous contents—this barbaric destruction program hardly went unnoticed. The health of local citizens was tremendously harmed, and, justifiably, they are angry.[28] The Presidential Committee must bear a great deal of the responsibility for allowing this unsafe destruction effort to proceed. Had the CWC been in force, I would note, this material would have been safely destroyed under international supervision.

Given these circumstances, the most extensive safety precautions possible must be used to destroy Russia's chemical weapons stockpile. If not disposed of properly, air currents can transport particles and fine dust containing chemical agents over long distances, literally hundreds

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a precise manner. It was not unusual to hear about guards that did not keep accurate records of weapons transfers, who "guestimated" how many munitions were in a shipment rather than actually counting them. Such an environment is conducive to foul play.

[26] For example, my analysis of the smokestack gases emerging from the Volgograd chemical weapons production facility revealed that these emissions regularly exceeded the permissible amount of nerve agent air emissions by 80 to 150 times, while the plant's water effluents were almost 1,000 times over the allowed concentration level.

[27] For example, in 1989, Soviet officials hailed their chemical weapons destruction facility at Chapayevsk as a state-of-the-art prototype, but citizen protests about the safety at the plant blocked operation of the facility. Karen Elliott House, "Toxic Dump," *Wall Street Journal*, 25 February 1993, A6.

[28] Vladimir Petrenko, "Response to General Danilkin's statements of 21 July 1994," Russian Green Cross, Program on The Environmental Legacy of the Cold War, Project Chemtrust-2, 1995.

of miles, exposing humans, animals, and the environment to possible contamination.[29] Russia's current blueprint calls for the chemical weapons to be destroyed by a two-step process, beginning with neutralization. Bilateral tests of Russia's proposed neutralization technology are now underway with U.S. government experts. While Russian authorities must gain the approval of U.S. and international experts, it is vitally important that they also begin to build a bridge of mutual understanding with the communities where these weapons are located. The Russian government should supply these communities with the information necessary for a full appraisal of their plan and the technologies to be used.[30] Without the involvement and consent of the public, the Russian destruction program will meet with citizens' resistance at every juncture.

CWC Ratification Needed

To the best of my knowledge, the development, testing, and production of chemical weapons has stopped in Russia, partly because of the aforementioned economic circumstances and partly as a result of the attention I drew to the situation. However, one unintended side-effect of my revelations about the binary program is that they have provoked doubt in some quarters about the wisdom of proceeding with ratification of the CWC. Having seen this system from the inside, I am thoroughly convinced that a ban on chemical weapons must be established and that the CWC is the vehicle to accomplish that goal.

What I did not understand when I first spoke out on these issues is that the CWC's negotiators built flexibility into the CWC to permit it to adapt to new scientific and technical developments. This adaptability was prudent because science does not stand still. The treaty contains provisions to permit additions to the list of banned and controlled chemicals and to improve inspection techniques and technologies to keep pace with such developments.[31] When Russia ratifies the CWC, the international community will have the right to inspect—extensively, frequently, and on a challenge basis, if needed—the facilities involved in the binary program. In the end, I am confident that the international authorities can get to the bottom of this matter through this process and that the appropriate additions will be made to the list of chemicals. Contrary to my initial assessment, I now understand that the CWC provides the means to bring the Russian chemical weapons complex under international monitoring. If the CWC's procedures are not instituted, the Russian chemical weapons complex will remain accountable only to the same clique of leaders, who have thus far not proven their trustworthiness.

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[29] For more on how chemical contaminants can be transported through the air, see Marjatta Rautio, et al., *Air Monitoring As A Means for Verification of Chemical Disarmament: C.2. Development and Evaluation of Basic Techniques* (Helsinki: Ministry of Foreign Affairs, 1985) and *Air Monitoring As A Means for Verification of Chemical Disarmament. C.4. Further Development and Testing of Methods* (Helsinki: Ministry of Foreign Affairs, 1987).

[30] Independent scientists should play a constructive role in this review, and citizens would be better equipped to make decisions if the media helped disseminate information to the public about the technologies under consideration. Several Russian and American colleagues support this type of collaborative, problem-solving approach between the Russian government and the local communities.

[31] I note with approval the plans to involve outside scientific experts in such evaluations. Article VIII of the CWC, paragraphs 21 (h) and 45, requires the Director-General of the Technical Secretariat to set up a Scientific Advisory Board with experts in scientific fields pertinent to the CWC's implementation.

Russia itself must take steps beyond ratifying and implementing the CWC to address the situation brought about by the existence of these new agents. In September 1992, Yeltsin signed Resolution 508-RP, which prohibits the export of chemical agents and their precursors. Those in charge of the chemical weapons complex purposefully drafted this resolution so that it did not list the chemicals involved in the binary program—namely Substance 33, the novichok agents, and the precursors for these agents. This situation must be rectified by adding the chemicals concerned to those prohibited from export to ensure that Russia's domestic nonproliferation provisions are as strong as possible.

Next, because I believe chemical weapons development, testing, and production have come to a halt, many qualified chemists and other specialists can no longer support themselves and their families. Those in the West who are concerned about the proliferation of chemical weapons should be more aware of the latent dangers created by this situation. These scientists may be persuaded by irresponsible regimes to use their skills to help with the clandestine development and production of chemical weapons.[32] To forestall a "brain drain" from the now mostly defunct Russian chemical weapons complex, it would be advisable to provide some assistance to these displaced chemical weapons experts. Such assistance might consist of grants to pursue scientific research unrelated to chemical weapons or training for new jobs in the civilian sector. Under the Nunn-Lugar program, similar assistance has been made available to nuclear weapons experts.

By now it is fairly common knowledge that Russia does not have the technical or financial means to destroy its chemical weapons stockpile on its own. Because of traditional security ties, Russia will continue to look to the United States for assistance with this difficult task, but other European countries are discussing what contributions they might make in this regard. For example, Germany has already begun a cooperative technical assistance program. Such assistance will undoubtedly be crucial to the safety and success of Russia's chemical weapons destruction program.

Conclusion

Leaders around the globe, but particularly in the United States and Russia, must muster the political will to address the problems associated with chemical weapons—how to destroy them safely, how to stem their proliferation, how to establish an international norm against their possession, and how to create an environment of cooperative security to take the place of states' reliance upon chemical weapons. The key to confronting all of these problems lies in the CWC; there is no time to waste in ratifying and implementing this important treaty Without the CWC, there will be no control of security, storage, or continued development of chemical weapons.

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[32] For example, whether purposefully or not, the Russian government may have facilitated the establishment of a conduit for the transfer of chemical weapons related knowledge and/or materials by signing an October 1992 agreement with Syria to create the Syrian Center of Ecological Protection. The Syrian center mainly works on the synthesis of polymer sorbents for the purification of water, air, and the environment. Russia has shipped the center at least seven laboratory cabinets, vacuum pumps, and other laboratory equipment, all of which could be used for purposes other than environmental work. This information came from my long-time GosNIIOKhT colleague, Professor Georgi Drozd, who worked for the individual in charge of the agreement's negotiation and implementation, General Kuntsevich, and is intimately familiar with the situation. On 4 April 1994, the FCS told Drozd and ten others summoned as witnesses that criminal charges were to be filed against Kuntsevich for suspicion of attempting to illegally export precursors for the synthesis of chemical warfare agents. The investigation of this matter continues.

The terrorist use of chemical agents in Japan this past spring should serve as ample warning that the global community can no longer ignore the problems that chemical weapons present. The consequences of doing so may be unpredictable and tragic.

Cooperative Threat Reduction Support to the Destruction of Russia's Chemical Weapons Stockpile

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The Cooperative Threat Reduction (CTR) Program is an effort to enhance the national security of the United States through cooperative engagements with Russia, Belarus, Kazakhstan, and Ukraine aimed at diminishing the threat posed by weapons of mass destruction along with their associated delivery systems. The Nunn-Lugar initiative establishing the CTR Program was a direct response to the political and economic uncertainties associated with the disintegration of the former Soviet Union that called into question the ability of the newly independent states to provide for the safe and secure transportation, storage, and eventual reduction or complete elimination of these weapons. With respect to chemical weapons, the objective of the CTR Program is to "jump-start" the Russian chemical weapons destruction program, specifically in the area of nerve agent destruction and thus to contribute to Russia's ability to meet the destruction milestones of the Chemical Weapons Convention. In addition, the accelerated destruction of the chemical weapons stockpile reduces the likelihood of the proliferation of these weapons.

This essay begins with a description of Russia's chemical weapons stockpile and a brief history and status report on Russia's chemical weapons destruction program. Next, the origins and organization of the CTR program are described before the discussion moves on to the activities, accomplishments, and plans for the programming related to Russia's chemical weapons destruction effort.

An Overview of the Russian Chemical Weapons Stockpile

After the Soviet Union splintered, the Russian Federation assumed responsibility for the former Soviet chemical weapons stockpile and treaty commitments related to it. The Russian stockpile is the largest declared stockpile in the world, consisting of 40,000 metric agent tons. Organo-phosphorous based nerve agents make up the majority of the stockpile (81%) with the balance comprised of blister agents (19%). The Russian stockpile contains three types of nerve agents: sarin, soman, and VX. In addition, the Russian stockpile contains thickened or viscous versions of the soman and VX agents. Thickened agents, comprising approximately 16% of the chemical weapons stockpile, are only used in air-delivered munitions. The arsenic-based agent lewisite constitutes the majority of the declared Russian blister agent stockpile with only very small portions of the stockpile consisting of mustard and a mustard/lewisite mixture.

Chemical agents in the Russian stockpile are contained in projectiles, rocket warheads, bombs, spray devices, SCUD missile warheads, and bulk storage containers. The majority of the blister agents are stored in large (50 cubic meter) bulk storage containers. All the nerve agent is weaponized, contained in either artillery munitions (projectiles or rocket warheads) or air-delivered munitions (bombs, spray devices, or missile warheads). There are a greater number of ground-based weapons as opposed to air-delivered munitions, but the air-delivered weapons represent the majority of the stockpile on an agent-tonnage basis. The stockpile is stored at the seven locations shown in Figure 1. Except for Shchuche,[1] all of the storage locations are west of the Ural mountains. Only one type of chemical weapon is principally stored at each installation: Kambarka and Gorny store bulk blister agents; Kizner and Shchuche are primarily nerve-agent-filled artillery munitions storage installations; and Pochep, Leonidovka and Maradykovsky store nerve agent-filled air-delivered munitions.

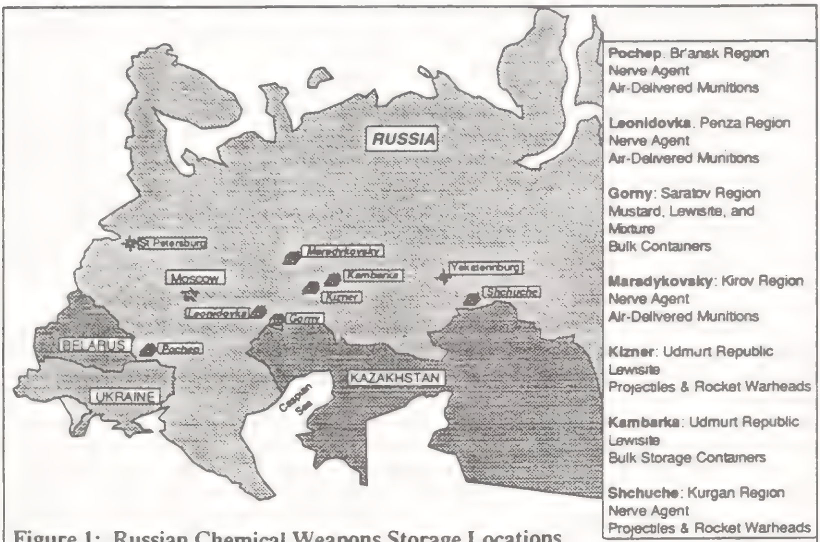

Figure 1: Russian Chemical Weapons Storage Locations

Unlike the U.S. chemical weapons stockpile, none of the Russian chemical weapons reportedly contain explosive components such as bursters, fuzes, or rocket motors. These components are stored separately from the agent-filled munitions. Another key difference between the Russian and U.S. chemical weapons is that the U.S. weapons were "pressed-fit" during assembly, while the Russian weapons were welded. Therefore, the U.S. approach of reverse assembly[2] is not applicable for Russian chemical agent-filled projectiles. Finally, the presence of thickened or viscous agents in the Russian stockpile could make draining these munitions more difficult than if the munition had been filled with unthickened versions of the same agent.

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[1] Shchuche is also commonly spelled Shchuch'ye.

[2] "Reverse Assembly" is the method used to drain chemical agent-filled projectiles at the U.S. chemical weapons destruction facilities. The process involves unscrewing the nose closure/lifting lug, extracting the pressed-fit burster well using an expandable collet and then inserting a drain probe to remove the agent under vacuum. Since the burster well of the Russian nerve agent-filled projectiles are welded to the munition casing it cannot be readily extracted. Therefore, an alternative must be used to access the chemical agent contained in the munition.

Status of Russian Chemical Weapons Destruction Efforts

Although Russia does not currently operate an industrial-scale chemical weapons destruction program, the Ministry of Defense (MOD) has previously used a mobile destruction process called KUASI to destroy 4,000 leaking munitions containing approximately 200 metric tons of nerve agents. The KUASI system employed a two-step destruction process that involved neutralizing the chemical agent with an organic reagent[3] and then incinerating the resulting agent mass. The KUASI system was demonstrated to the members of the United Nations Conference on Disarmament in 1987.

Planning for destruction of the main chemical weapons stockpile began in the 1986-1989 time-frame when the demonstration facility near the town of Chapayevsk in the Kuybyshev Region was designed and constructed. The destruction process used in this facility was based on the two-step technology first employed in the KUASI mobile destruction system, but modified to meet the through-put requirements of an industrial-scale facility. Because of reported opposition from local officials arising from concerns about inadequate safety and environmental protection measures, the Chapayevsk facility was never commissioned and has never processed any chemical-agent-filled munitions.

In February 1992, President Boris Yeltsin established the Committee on Conventional Problems of Chemical and Biological Weapons of the Russian Federation.[4] Commonly referred to as the President's Committee, it is responsible for organizing Russia's chemical weapons disarmament efforts. In October 1992 this Committee submitted a Program to the State Duma[5] for the phased destruction of Russia's chemical weapons. The document described an approach for destroying the blister agent stored at Kambarka and Gorny in Phase I, and for the nerve agent-filled artillery munitions stored at Kizner and Shchuche in Phase II. Destruction of the air-delivered munitions stored at Pochep, Leonidovka, and Maradykovsky was not discussed. This plan proposed on-site destruction of the blister agent stored at Kambarka and Gorny, and relocation of the nerve agent-filled artillery munitions stored at Kizner and Shchuche to Novocheboksarsk, in the Chuvash Republic. There, they would be destroyed in a converted former VX production facility.

The State Duma returned the program plan to the President's Committee in March 1993, requesting that a more comprehensive plan be prepared and resubmitted that would encompass the entire chemical weapons stockpile. One of the main concerns about the original plan was the collocation of the chemical weapons stored at Kizner and Shchuche to Novocheboksarsk. This objection was raised by the Representatives from the republics that the collocated munitions would travel through enroute to Novocheboksarsk. After March 1993, many of these republics passed laws prohibiting the transportation of chemical weapons through their territory. These laws apparently convinced Moscow that chemical weapons destruction--or at least detoxification of the agent--would need to be accomplished where the agent/munitions are stored.

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[3] The reagent used for mustard, sarin, and soman was monoethanolamine (MEA). A mixture of ethylene glycol and phosphoric acid was used for VX.

[4] Presidential Decree #160, 19 February 1992, Establishment of the Committee for Conventional Problems of Chemical and Biological Weapons Under the President of the Russian Federation.

[5] The State Duma is roughly equivalent to the House of Representatives in the United States Congress.

In March 1995, a Presidential Decree mandated that all chemical weapons in Russia be destroyed in facilities specifically built for this purpose and located in the regions where the weapons are currently stored.[6] This statement clearly acknowledged the anxiety caused by the October 1992 plan. Moscow's intention was to alleviate the concerns of the other regions through which chemical weapons would be transported or destroyed in their territories. In addition, the decree stated that chemical weapons destruction would be funded through a separate line item in the federal budget, thus helping to ensure that all moneys budgeted for chemical weapons destruction were used for this purpose and not diverted to other programs. Finally, the Decree delineated the roles and responsibilities of 12 executive branch ministries and committees in the area of chemical weapons disarmament (e.g., destruction and treaty compliance) and established an Interdepartmental Commission on Chemical Disarmament. This new commission, to be headed by National Security Advisor Yuri M. Baturin, would be responsible for coordinating the executive branch's efforts in such areas as administering the funding appropriated for chemical weapons disarmament. Within the executive branch of the Russian Government, the MOD was designated the "Government Customer" responsible for the development and operation of the destruction facilities, along with maintaining the safe storage of the weapons until their destruction. In other words, the Russian MOD and U.S. Department of Defense (DOD) now have analogous responsibilities for the destruction of their respective chemical weapons stockpiles.

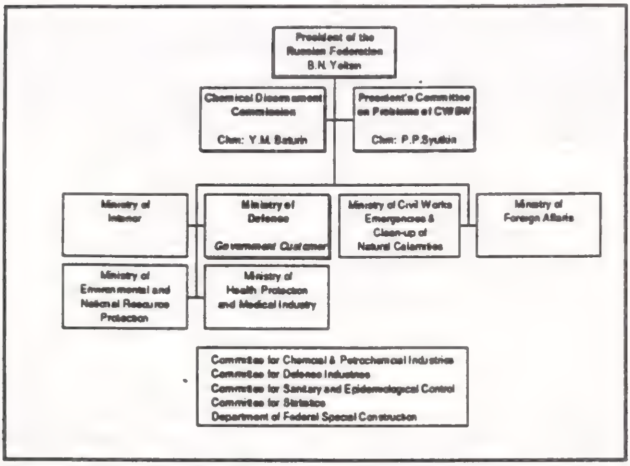
President of the Russian Federation B.N. Yeltsin
Chemical Disarmament Commission
Chm: Y.M. Baturin
President's Committee on Problems of CW/BW
Chm: P.P. Syutkin
Ministry of Interior
Ministry of Defence
Government Customer
Ministry of Civil Works Emergencies & Clean-up of Natural Calamities
Ministry of Foreign Affairs
Ministry of Environmental and National Resource Protection
Ministry of Health Protection and Medical Industry
Committee for Chemical & Petrochemical Industries
Committee for Defence Industries
Committee for Sanitary and Epidemiological Control
Committee for Statistics
Department of Federal Special Construction

Figure 2: Key Russian Government Organizations Associated with Chemical Weapons Destruction

Treaty Obligations

In January 1993, both the United States and the Russian Federation, along with 128 other nations, signed the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, commonly referred to as the CWC. The CWC prohibits the development, production, stockpiling, transfer and use of chemical weapons as well the provision of assistance to any states attempting to pursue these activities. Additionally, the signatories agree to destroy existing chemical weapons stockpiles within the specified timeframe shown in Table 3.

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[6] Presidential Decree #314, 24 March 1995, Preparing the Russian Federation for Fulfilling Its International Obligations in the Field of Chemical Disarmament.

Table 3: Key Chemical Weapons Convention Destruction Milestones

Phase	Entry Into Force (EIF) Milestone (Years)	Destruction Requirement
1	EIF + 2 EIF + 3	♦ Complete testing of its first destruction facility ♦ Not less than 1% of declared stockpile (on agent tonnage basis)
2	EIF + 5	♦ Not less than 20% of declared stockpile
3	EIF + 7	♦ Not Less than 45% of declared stockpile
4	EIF + 10	♦ 100% of declared stockpile

In helping Russia destroy its chemical weapons stockpile, the CTR program supports the principal objective of the CWC that a country's entire stockpile be destroyed within 10 years after the CWC enters into force, which will occur 180 days after the 65th signatory country submits its document of ratification to the United Nations. Although the destruction objectives are clearly stated, the CWC also specifies that chemical weapons destruction operations need to be carried out using environmentally safe methods. The CWC also provides for extensions, up to a maximum of five years, subject to a decision by the Conference of State Parties. A treaty party may request an extension if it believes it will be unable to meet the ten-year deadline.

The Cooperative Threat Reduction Program

The political and economic conditions that accompanied the disintegration of the Soviet Union at the end of 1991 called into question the ability of the newly independent states (NIS) of the former Soviet Union to maintain effective control over their arsenals of weapons of mass destruction (WMD). Political, social, and economic upheaval heightened the prospects that the former Soviet republics would not be able to provide for safe and secure storage or disposition of these weapons. Although significant positive changes were occurring in the NIS and many of the threats that confronted the United States throughout the Cold War were disappearing, these weapons and materials continued to pose a risk to U.S. national security interests.

Congress responded to these conditions and associated threats by initiating the CTR program in November 1991. Often referred to as the Nunn-Lugar program after the senators who spearheaded the effort, this bipartisan congressional initiative authorized DOD to assist eligible states of the former Soviet Union in weapons dismantlement and destruction. The CTR program is not traditional foreign aid; rather, it is defense by other means. The CTR program is a unique approach to mitigating the dangers associated with the WMD in the NIS and for helping to reduce the possibility that these dangers will rise again in the future. The United States' objectives in the CTR program as established by Congress are to cooperate with the NIS to:

- destroy weapons of mass destruction;
- transport, store, disable, and safeguard weapons in connection with their destruction;
- establish verifiable safeguards against the proliferation of such weapons;
- prevent diversion of weapons-related expertise;
- facilitate demilitarization of defense industries and conversion of military capabilities and technologies; and,
- expand defense and military contacts between the United States and the NIS.

CTR Program implementation is managed and directed by the CTR Program Office within the Office of Dr. Harold P. Smith, Assistant to the Secretary of Defense (Atomic Energy). Established in May 1994 by direction of the Secretary of Defense, my program office coordinates the development of long-range plans with policy direction from the Assistant Secretary of Defense (International Security Policy) and executes those plans through the Defense Nuclear Agency (DNA). To a lesser degree, the On-Site Inspection Agency (OSIA), the U.S. Army Program Manager for Chemical Demilitarization,[7] and the U.S. Army Corps of Engineers are also involved. The CTR Program Office establishes a single focal point within DOD for all program implementation matters and provides the structure and oversight necessary for effective and efficient program management. DNA is responsible for actual project execution, and, along with OSIA and the Army, provides the professional staff to turn policy and legislative direction into tangible, on-the-ground assistance. This work includes supporting the audits and examinations process to ensure that CTR assistance is being used for the purposes intended, in accordance with legislative mandates.

Through the CTR program, DOD provides equipment, services, and technical advice to Russia, Belarus, Kazakhstan, and Ukraine to assist them in the safe and secure transportation, storage, and eventual elimination (or in the case of Russia, the reduction) of the remaining Soviet-era weapons; to prevent proliferation; to dismantle the associated infrastructure; and to help transform portions of the infrastructure into peaceful civilian assets. In each of fiscal years 1992 and 1993, Congress authorized DOD to transfer $400 million from existing DOD accounts to support the Nunn-Lugar program. Subsequent legislation in fiscal years 1994 and 1995 provided for direct appropriations of $400 million each year.[8]

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[7] After a recent reorganization, the U.S. Army Chemical Materiel Destruction Agency (USACMDA) is now known as PMCD.

CTR Chemical Weapons Destruction Support Program

Although CTR's emphasis has been on nuclear weapons and fissile materials, the dangers inherent in the Russian chemical weapons stockpile and the challenges in destroying it have made CTR efforts to assist Russia's chemical weapons destruction efforts a key element in America's multi-year strategy to help dismantle former Soviet weapons of mass destruction. The CTR Chemical Weapons Destruction Support program was established on 30 July 1992, when DOD signed an agreement with the President's Committee concerning the safe, secure, and ecologically sound destruction of chemical weapons.[9] This agreement stipulated a funding limit of $25 million to accomplish five tasks: develop a concept plan for the Russian chemical weapons destruction program; conduct a familiarization (intern training) program; host visits to U.S. chemical weapons destruction facilities; provide chemical weapons detectors, systems for analysis, and alarms; and provide tutorials and demonstration of protective equipment. The agreement also contained a provision for additional support to the Russian chemical weapons destruction program at the discretion of DOD. Such support could include the creation of a national laboratory, joint evaluations related to chemical weapons destruction, and other mutually-agreed support. In March 1994, an amendment to the July 1992 agreement was signed by DOD and the President's Committee that increased the funding limit from $25 to $55 million.

The objective of the CTR Chemical Weapons Destruction Support Program is *not* to achieve the complete destruction of the Russian chemical weapons stockpile—that goal is beyond the scope of the CTR program both in terms of cost and time. Rather, the CTR program is focused on jump-starting the Russian chemical weapons destruction program, specifically in the area of nerve agent destruction, and thus contributing to Russia's ability to meet the destruction milestones of the CWC. The program is focused on the destruction of Russia's nerve agent stockpile because these weapons represent the greatest threat to U.S. security interests. The nerve agent is weaponized, not in bulk storage containers, and these munitions comprise over 80% of the entire Russian chemical weapons stockpile. Through CTR assistance, it is hoped that the two-step technology selected by Russia will be proved out, the necessary pilot and/or demonstration activities will be completed, and a full scale destruction facility will be started and ideally begin through-put operations. With this kind of jump start and the resulting lessons learned, Russia will be much better prepared to carry out destruction operations at the other storage facilities and continue down the path of CWC implementation.

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[8] In January 1995, the CTR Program Office published a multi-year CTR Program Plan in response to congressional direction in the fiscal year 1995 National Defense Authorization Act. The plan describes CTR activities and funding requirements beginning with fiscal year 1996 and concluding at the end of fiscal year 2001.

[9] Agreement Between the Department of Defense of the United States of America and the President's Committee on Conventional Problems of Chemical and Biological Weapons of the Russian Federation Concerning the Safe, Secure and Ecologically Sound Destruction of Chemical Weapons, signed 30 July 1992.

To meet the objective of the CTR Chemical Weapons Destruction Support Program, the four-tier program illustrated in Figure 3 has been developed. This program culminates with the design and construction of a destruction demonstration facility for nerve agent-filled artillery munitions. Russia is expected to use the experience gained from this first nerve agent destruction facility, once it has begun operations, to complete the destruction of its remaining nerve agent stockpile. Annual plans of work are developed jointly between DOD, the President's Committee, and the MOD to delineate the roles and responsibilities of each party in accomplishing agreed tasks. These plans of work also serve as the basis for developing statements of work for supporting contractual efforts.

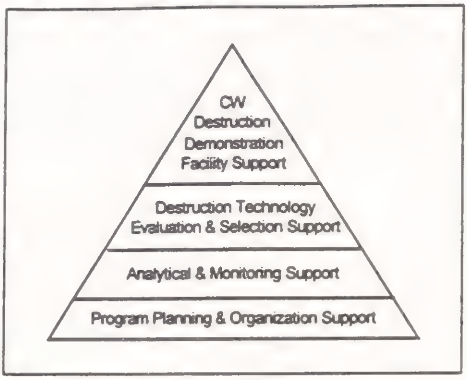
CW Destruction Demonstration Facility Support
Destruction Technology Evaluation & Selection Support
Analytical & Monitoring Support
Program Planning & Organization Support

Figure 3: CTR Destruction Support Program

Naturally, there is a desire and expectation to begin moving earth and building structures immediately. Nevertheless, chemical weapons destruction is an enormously complicated task and one that receives a great deal of scrutiny by the public, both here in the United States as well as in Russia. The success of such a program is dependent on the quality of planning and preparation that forms the foundation for more visible progress such as constructing destruction facilities. Consequently, much of the initial efforts of the CTR Chemical Weapons Destruction Support Program has focused on working with the President's Committee and the MOD to jointly develop this foundation, while at the same time constantly looking for areas of cooperation that could accelerate the start of destruction activities. Objectives and activities under each of the tiers -- from base to apex -- are as follows:

The first objective is to provide assistance to the Russian government in the organization and planning for the destruction of the declared nerve agent stockpile. This tier of the support program has two goals: to develop a common technical basis for all cooperative efforts and to ensure that there is a detailed and well-defined plan for the destruction of the Russian chemical weapons stockpile. The first element is being achieved through a variety of activities (e.g., visiting destruction facilities, conducting intern familiarization programs, and developing a bilingual glossary of chemical weapons-related terminology to help avoid miscommunications). The second element is being accomplished by the joint development of a comprehensive implementation plan for the Russian chemical weapons destruction program.

The Chemical Weapons Destruction Support Office (CWDSO) was established in Moscow in June 1993 to serve as the in-country technical focal point for U.S. support to the Russian chemical weapons destruction program. The CWDSO provides U.S. government and contractor personnel with a fully-equipped facility to meet and work with their Russian colleagues in a less formal environment where the technical details and issues associated with chemical weapons destruction can be addressed and resolved in a business-like fashion. The CWDSO has also developed a bilingual glossary of chemical weapons terminology and performs the majority of the translations (both English-to-Russian and Russian-to-English), thus helping to ensure the accuracy and consistency of the translation and resulting discussions.

A number of visits to U.S. destruction facilities and to the U.S. Chemical Demilitarization Training Facility at Aberdeen Proving Ground, Maryland, have been conducted for members of the President's Committee and MOD. Several members of the State Duma, as well as local officials of communities near some of the Russian chemical weapons storage installations, have also participated in these visits. The visitors have been shown the extensive amount of planning and preparation that goes into the design, construction, and operation of a chemical weapons destruction facility. They also demonstrate that chemical weapons destruction can be accomplished in a safe and environmentally sound manner. As part of this effort, in July 1994 a group of U.S. engineers and safety and environmental specialists visited the Chapayevsk site to become more familiar with Russian facility concepts for chemical weapons destruction.

From September 1993 through March 1994, six Russian chemists and engineers participated in an intern familiarization program conducted at the Aberdeen training facility. During their stay, the interns received classroom training and "on-the-job" training in Aberdeen as well as the U.S. chemical weapons destruction facilities in Tooele, Utah, and on Johnston Island in the Pacific Ocean. In addition, many of the interns attended town-hall meetings with local citizens from communities near proposed United States chemical weapons destruction facilities. These activities familiarize the Russians with the technical, legislative, and management aspects of the U.S. chemical weapons destruction program so that they can apply these experiences, as appropriate, to the Russian program. Several of these interns will also be working with U.S. personnel on the joint evaluation of the Russian nerve agent neutralization reactions described later in this paper.

In May 1994, a contract was awarded to a U.S. contractor team led by Bechtel National Incorporated (BNI) to prepare the comprehensive implementation plan for the Russian chemical weapons destruction program. Representatives from both the President's Committee and the MOD participated in the Source Selection and Evaluation Board that recommended the BNI contractor team. The comprehensive implementation plan is intended to provide a detailed and well-defined plan for the destruction of the Russian chemical weapons stockpile, describing program cost and schedule, the basis for destruction technology and facility location selection, design criteria for the destruction facilities, results of the site characterization of the proposed locations for the future chemical weapons destruction facilities, public outreach and education programs, and recommendations for an emergency preparedness program.

In February 1995, DOD accepted a Russian suggestion to rescope the comprehensive implementation plan in a phased approach that more closely parallels MOD's approach for its chemical weapons destruction program. Rather than addressing the entire Russian chemical weapons destruction program at the outset, initial work will focus on the first destruction facility for nerve-agent-filled artillery munitions. Following a meeting with local officials from the Kurgan regional administration and the town of Shchuche in July 1995, a protocol was signed authorizing the selection of a site for a pilot chemical weapons destruction facility and authorizing the MOD to prepare a feasibility study for the creation of the facility.[10] Based on this agreement, the implementation plan for the Shchuche pilot chemical weapons destruction facility will be completed by mid-1996. The balance of the comprehensive implementation plan could be undertaken in 1996 as work on the Shchuche destruction facility gets underway.

The second objective of this overall program is to assist in the development of industrial and chemical agent analytical and monitoring procedures for use at the declared nerve agent storage and destruction facilities. Chemical agent and environmental monitoring at and in the area surrounding a chemical weapons destruction facility is a critical element of any chemical weapons destruction program. Not only is this information necessary for the facility operators, but it is necessary to address public concerns about the impact and safety of chemical weapons destruction activities. This capability must be in place prior to the start of destruction operations so the necessary personnel can be trained and an environmental baseline established that would be used to assess the impact of chemical weapons destruction operations. The second tier of the CTR Chemical Weapons Destruction Support Program addresses this requirement by helping to establish a central chemical weapons destruction analytical laboratory (CAL). The CAL will be responsible for developing chemical agent analytical and monitoring procedures for use at the destruction and storage facilities; training chemical weapons destruction and storage personnel; serving as the quality assurance/quality control center for the destruction and storage analytical and monitoring efforts; and conducting analysis of environmental samples comparable to an Environmental Protection Agency certified laboratory.

Although an agreement in principal was reached in March 1994 when the amendment to the 30 July 1992 agreement was signed, substantive work on the CAL was delayed until a location for the laboratory was approved and the necessary permits received. In April 1995, the President's Committee informed DOD that building 14 at the Moscow State Scientific Research Institute of Organic Chemistry and Technology (GosNIIOKhT) had been selected as the location for the CAL. A U.S. facility assessment team visited GosNIIOKhT in May 1995. Negotiations are currently underway between U.S. and Russian technical experts to develop a mutually agreed concept for refurbishing building 14. The CAL is expected to be operational by the end of 1997.

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[10] PROTOCOL of the Meeting in Shchuche, Kurgan Region, Concerning the Review of the Request Made by A.B. Chubais, Head of the Government of the Russian Federation Dated 17 July 1995, No. ACh-P7-21183, 27 July 1995.

In addition to the refurbishment of building 14 at GosNIIOKhT, DOD is procuring three mobile laboratories for use at the storage installations. These mobile labs are similar to the real-time analytical platforms that DOD uses at its chemical weapons storage installations. They will provide the MOD with the capability to monitor the interior of a munition storage building before it is opened (i.e., "first-entry monitoring"), as well as perform environmental monitoring of the area surrounding the storage installation. Acceptance testing and operating training will begin in January 1996, followed by delivery of the mobile laboratories to Russia. These mobile labs are expected to be operational by May 1996.

The third major objective of CTR assistance in this area is to assist in the evaluation, selection, and development of the destruction technologies that will be used to destroy the declared nerve agent stockpile. The major obstacle in helping jump-start the Russian chemical weapons destruction program has been the absence of a Russian decision on a destruction technology. In February 1994, the U.S. provided a copy of the design package for the Newport Indiana, chemical weapons destruction facility. The design package was provided to the MOD and President's Committee as a cost-effective method for destroying U.S. bulk munitions and containers that could be adapted readily for the Russian nerve agent-filled air-delivered munitions. In May 1994, the President's Committee indicated to the United States that direct incineration would not be acceptable in Russia. In September 1994, the MOD and President's Committee informed DOD that a two-step destruction process involving chemical neutralization with organic reagents, followed by a treatment process called bituminization, had been selected as Russia's national chemical weapons destruction technology for nerve agent-filled munitions. The United States has very little information about industrial-scale neutralization of chemical agents with organic reagents. The Army had used aqueous sodium hydroxide to neutralize sarin in the late 1970s and early 1980s, but had encountered various difficulties that contributed to the decision to adopt direct incineration as the U.S. destruction technology. In addition, the United States had no information on the bituminization process proposed to treat the substance generated as a result of the neutralization reaction. Following intensive bilateral discussions in November 1994, it was agreed that a U.S.-Russian joint evaluation of the two-step nerve agent destruction process would be conducted.

This joint evaluation will occur in two phases. The first phase was conducted at the U.S. Army Edgewood Research, Development and Engineering Center located at

Aberdeen Proving Ground, Maryland, from May to August 1995. U.S. nerve agents were used during these tests. The second phase will occur at the Saratov Military Engineering College of Chemical Defense, using Russian nerve agents from October through November 1995. The evaluation consists of three 50-gram tests for each of the three types of nerve agent contained in artillery munitions: sarin, soman, and Russian VX. For sarin and soman, the same neutralization reaction that had been used with the KUASI system, monoethanolamine, will be used. For VX, the Russians have chosen a new neutralization reaction using potassium isobutylate. The CTR program provides for identical analytical equipment to be available in both laboratories for the joint evaluation and ensures that personnel receive the necessary training to operate the equipment properly. Both U.S. and Russian environmental and safety criteria are being used to evaluate the destruction process, and limited engineering data is also being collected to assist in the follow-on design efforts.

The final objective of the Chemical Weapons Destruction Support Program is to assist in the design and construction of a chemical weapons destruction demonstration facility. Based on the results of the technology evaluation, it is DOD's intention to ask Congress for funding to assist in the design and construction of a pilot chemical weapons destruction facility at Shchuche. This facility would effectively realize the CTR objective of jump-starting the Russian program by providing Russia with a demonstrated chemical weapons destruction process/technology that could be used to destroy the remaining nerve agent-filled chemical munitions. The qualifier "pilot" is used merely to connote that it may be necessary or desirable for the facility to begin with a lower initial destruction capacity that could be expanded later by adding modular process lines after successful demonstration of the initial process line. After expansion, the full-scale facility would be capable of destroying the remaining nerve agent-filled artillery munitions stored at Shchuche within three years.

A separate CTR implementing agreement will be negotiated for DOD assistance in the design and construction of the destruction facility. The agreement will clearly stipulate DOD and Russian roles and responsibilities and will provide for specific linkage between DOD assistance and Russian performance.

A U.S. integrating contractor will be hired to provide the assistance in the design and construction of the destruction facility. DOD can only obligate funds that are legally available for this purpose. Consequently, funding for the contract will be provided in annual increments, subject to congressional appropriation and annual certification that the specific conditions in the agreement are being met.

Conclusion

This paper has provided an overview of the CTR program and, more specifically, its role in helping to jump-start the Russian chemical weapons destruction program. The on-going United States effort to destroy its own chemical weapons stockpile proves how difficult and immense the task can be. Russia, with a stockpile of 40,000 metric tons of chemical agents, faces an even greater task, one compounded by the terrible condition of the Russian economy. The assistance from the CTR program will play an important role in the Duma's decision to ratify the CWC, and in the Russian effort to destroy their chemical weapons stockpile.

Admittedly, work has not proceeded as rapidly as hoped. However, strides have been made, and events over the last six months indicate that the progress of this cooperative endeavor should improve both in pace and in substance. The technical and political complexities associated with chemical weapons destruction as well as the funding structure of the CTR program will continue to challenge both countries in this effort. Nevertheless, we must not lose sight of the fact that Russia's 40,000 metric ton stockpile is the largest in the world and U.S. national interests are served very well by helping Russia rid the world of these weapons of mass destruction.

The United States, Russia, and Chemical Weapons Disarmament: Choices Ahead

Amy E. Smithson

Although some U.S. security concerns about Russia eased with the end of the Cold War, other concerns and complications have arisen. While the United States no longer truly fears that Russia would wage chemical warfare against America or its allies, U.S. policy makers still face decisions regarding the chemical weapons expertise and arsenal that Russia inherited from the Soviet Union.

The United States negotiated with the Soviet Union bilaterally and in an international forum to conclude agreements that would initiate and monitor the process of chemical weapons disarmament. Common wisdom held that the U.S. Senate would quickly approve such accords. After all, a decade ago Congress mandated the destruction of the U.S. chemical weapons stockpile; the U.S. military finds these weapons repugnant and of no strategic value and little utility on the battlefield; and the public has long viewed chemical warfare as abominable. Then, charges surfaced that Russia was harboring a chemical weapons development program of Soviet origin. These allegations have caused some in the Senate to have second thoughts.

The first section of this essay provides a history of the international and bilateral routes that have been taken toward the prohibition and elimination of chemical weapons, focusing on developments in the past few years. The next segment of the essay reviews the factors that have managed to throw both paths off course. In the closing section of the essay, the analysis addresses the path most likely to help the United States achieve its stated goals regarding chemical weapons nonproliferation and disarmament. The concluding section also speaks to whether continued U.S. assistance to Russia for chemical weapons destruction is advisable, given U.S. concerns about a possible covert chemical weapons program.

The Puzzle and Its Pieces

In 1960, 18 nations began what would turn out to be a long quest for a treaty to ban the development, production, stockpiling, and use of chemical weapons, known as the Chemical Weapons Convention (CWC). Compared to the headline-grabbing U.S.-Soviet nuclear arms control talks, the CWC negotiations in the Conference on Disarmament (CD) were a sleepy backwater. More delegations joined the CWC negotiations as the years passed. By the time the CWC was concluded in 1992, 39 nations were at the negotiating table in Geneva, with another 40 observing the process.

Two issues in particular bedeviled the negotiators at the CD. The first was a vast commercial industry that worked with "dual-use" chemicals to manufacture everyday products such as fertilizers, pharamaceuticals, textile dyes, and ceramics. These chemicals could also be used, however, to make the very blister and nerve agents that the negotiators sought to ban. The second issue was how to prohibit chemical weapons development, yet allow states to maintain their defense preparedness. States needed to be able to continue to conduct defensive research, but the difference between defensive research and offensive development activities can be hard to discern. Both of these areas would make compliance with treaty obligations very difficult, at best, to verify.

In 1984, then-Vice President George Bush presented a proposal designed to tackle the verification problems inherent in the CWC. Bush proposed any time, any place inspections. These challenge inspections would buttress the CWC's data declarations and routine inspections with a short-notice inspection of any commercial, research, or other site suspected of engaging in prohibited activities.[1] The delegations at the CD were stunned. While the United States had long advocated on-site inspections, such measures had yet to be incorporated into any superpower arms control agreement. In the multilateral CD, the concept of challenge inspections was, to say the least, revolutionary.

As the CD delegations began to digest Bush's proposal, they started to receive more assistance from representatives of the chemical industry, which picked up its level of involvement in the negotiations. Chemical industry provided pragmatic advice about how to structure the data declarations and conduct inspections. Working to see the CWC's objectives reached in a way that protected their proprietary interests, industry representatives also offered their facilities for tests of the verification procedures under consideration.[2]

Iraq's use of chemical weapons during the Iran-Iraq War of the 1980s underlined the need to strengthen the 1925 Geneva Protocol's norm against the use of chemical weapons. Since the Protocol's members are still allowed to develop, produce, and stockpile chemical weapons, the Protocol's trip wire barring states from using chemical weapons is considered to be thin.[3] Moreover, many states that ratified the Protocol reserved the right to retaliate in kind against a chemical attack,[4] believing that deterrence of a chemical attack rested mainly with the threat of equal retaliation. The pace of the CD negotiations remained glacial, even in the face of Iraq's violation of the Geneva Protocol. This lack of responsiveness can be attributed largely to the fact that the two superpowers were still so far apart on the major issues of the negotiations, especially on verification. A promising sign that this gap would begin to close came with Soviet Premier Mikhail Gorbachev's April 1987 announcement that the Soviet Union had ceased producing chemical weapons.[5] A major breakthrough occurred when the Soviet Union accepted the principle of challenge inspections in August 1987,[6] but the negotiators continued to disagree about how to conduct such inspections.

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[1] For an overview of negotiations and the issues involved therein, see Victor A. Utgoff, *The Challenge of Chemical Weapons* (New York: St. Martin's Press, 1991); Brad Roberts, ed., *Chemical Disarmament and U.S. Security* (Boulder: Westview Press, 1992).

[2] The Chemical Manufacturers Association (CMA) was honored for its efforts in this regard on 8 May 1995, when the Lawyers Alliance for World Security and the Committee for National Security presented CMA with the W. Averell Harriman Award. For more on industry-related issues, see the testimony of Dr. Will B. Carpenter, Senate Foreign Relations Committee, *Hearings on the Chemical Weapons Convention*, 103d Cong., 2d sess., S.Hrg. 103-869 (Washington, D.C.: U.S. Government Printing Office, 1994), 88-92; U.S. Congress, Office of Technology Assessment, *The Chemical Weapons Convention: Effects on the U.S. Chemical Industry*, OTA-BP-ISC-106 (Washington, D.C.: U.S. Government Printing Office, August 1993); Amy E. Smithson, ed., *Implementing the Chemical Weapons Convention: Counsel from Industry*, Report No. 10 (Washington, D.C.: Henry L. Stimson Center, January 1994).

[3] The Australian government formed an export control group in 1985 to restrict the flow of dual-use chemicals and thereby curtail their contribution to chemical warfare in this conflict. The Australia Group coordinates export control policies among supplier nations, with its participants assessing requests for such chemicals on a case-by-case basis. Gradually, the number of participants and chemicals controlled increased to over 25 and 50, respectively. See Julian Perry Robinson, "The Australia Group: A Description and Assessment," in *Controlling the Development and Spread of Military Technology: Lessons from the Past and Challenges for the 1990s*, eds. Hans Gunter Brauch, Henny J. Van Der Graff, John Grin, and Wim A. Smit (Amsterdam: Vu University Press, 1992), 157-76.

To breathe more life into the CWC negotiations, the Soviet Union and the United States began to accelerate a parallel track of negotiations. First, the two superpowers sought to demonstrate that the verification procedures proposed for the CWC were workable and tolerable. In September 1989, Secretary of State James Baker and Soviet Foreign Minister Edward Shevardnadze met in Jackson Hole, Wyoming, to sign a Memorandum of Understanding. Therein, both parties *voluntarily* agreed to two phases of data exchanges and reciprocal practice inspections. The USSR declared possessing a chemical weapons stockpile of 40,000 metric tons in the data exchanged at the end of 1989. The first phase trial inspections took place the next year at two production facilities, three storage facilities, and two industrial chemical facilities in each country.

The United States declared a stockpile of approximately 30,000 metric tons and inaugurated its destruction program in mid-1990 at a pilot plant on Johnston Atoll in the Pacific Ocean. The U.S. Army initiated this program under a November 1985 congressional mandate to destroy over 95 percent of the aging U.S. stockpile unilaterally.[7] The U.S. Army selected incineration as the method to destroy the stockpile at eight sites in the continental United States where it is stored. Controversies associated with the safety of incineration brought resistance from some citizens at these sites, but this program has maintained its slow forward momentum under the careful oversight of the U.S. National Academy of Sciences and numerous federal regulatory agencies.[8]

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[4] The United States, which did not ratify the Geneva Protocol for 50 years, was among the nations that attached this condition. For a complete list, see U.S. Arms Control and Disarmament Agency, *Arms Control and Disarmament Agreements Texts and Histories of the Negotiations* (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 1990), 16-19.

[5] Gorbachev made this announcement on 10 April 1987 in Prague. Edward M. Spiers, *Chemical Weaponry. A Continuing Challenge* (New York: St. Martin's Press, 1989), 127.

[6] U.S. Arms Control and, Disarmament Agency, "Chronology of Events Leading to the Signing of the Chemical Weapons Convention," Fact Sheet (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 5 January 1993). The USSR's concession on this matter, which was announced on 6 August 1987, coincided with similar progress in a bilateral negotiation that produced the 1987 Intermediate-Range Nuclear Forces Treaty. Not that long thereafter by the 1990 Conventional Forces in Europe Treaty and the 1991 Strategic Arms Reduction Treaty. For a chronology of key developments in U.S. and Soviet/Russian Chemical Weapons Disarmament, see the appendix.

[7] Public Law 99-145 ordered the destruction of all unitary chemical weapons by September 1994. At that time, the Army estimated the cost of the U.S. destruction program to be $1.7 billion.

[8] At present, the Army is exploring alternative technologies such as neutralization for possible use at two of the eight U.S. sites. For more on the controversies associated with the U.S. program, see Amy E. Smithson with the assistance of Maureen Lenihan, *The U.S. Chemical Weapons Destruction Program: Views Analysis, and Recommendations*, Report No. 13 (Washington, D.C.: Henry L. Stimson Center, September 1994). The first of the full-scale destruction facilities

In another effort to prod the CD negotiations along, the Soviet Union and the United States tried to convey their commitment to the goal of chemical disarmament through a Bilateral Destruction Agreement, known as the BDA. To the other CD delegations, it was fitting that the possessors of the world's two largest stockpiles would lead this process. The June 1990 BDA stipulated that the United States and the Soviet Union stop producing chemical weapons and reduce their respective stockpiles to no more than 5,000 agent tons. Each party would monitor the other's destruction process with the continuous presence of inspectors and monitoring instruments at destruction and storage facilities. Destruction was to begin no later than 31 December 1992 and be completed by the end of 2002.[9] The BDA would be brought into force with the exchange of legal documents.

Saddam Hussein's threats to wage chemical warfare during the 1991 Persian Gulf War proved to be the final impetus needed to conclude the CWC. After the war, President Bush provided another incentive to the CD negotiators when he announced on 13 May 1991 that upon entry into force of the CWC, provided the Soviet Union was a participant, the United States would forswear the future U.S. use of chemical weapons for any purpose, including retaliation against a chemical attack. The entire U.S. arsenal would also be eliminated.[10] Bush's action signified a major change from the accepted wisdom of how chemical attacks could best be deterred. Later testifying in support of the CWC's ratification, Chairman of the Joint Chiefs Gen. John M. Shalikashvili stated that even though the U.S. will not retaliate in kind, "it still retains a retaliatory capability second to none," and that the U.S. response to a chemical weapons attack would nonetheless be "absolutely overwhelming" and "devastating." Advanced conventional munitions would most likely be used.[11] Nations participating in the CWC negotiations took note of this total renunciation of chemical weapons by the United States.

In the spring of 1992, Australia also helped to reinvigorate the CD with a draft text of artful compromises on the major outstanding issues.[12] The CD negotiators worked through the summer to bring these marathon negotiations to a close, leaving the settlement of smaller operational details to a Preparatory Commission composed of the CWC's signatories. This final stage of the negotiations coincided with the Russian government's struggle to get on its feet in the aftermath of the Soviet Union's collapse. New Russian President Boris Yeltsin publicly committed Russia to abide by the international arms control agreements signed by the Soviet

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is slated to begin operating this winter at Tooele, Utah.

[9] The White House, "US-USSR Chemical Weapons Destruction Agreement," Fact Sheet (Washington, D.C.: Office of the Press Secretary, 1 June 1990).

[10] "Chemical Weapons Arms Control, Chronology of Key Events: 1925-1992," Issues Brief (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 1 April 1992), 8.

[11] "Testimony of Gen. John M. Shalikashvili" before the Senate Armed Services Committee, *Military Implications of the Chemical Weapons Convention (CWC)*, 103d Cong. 2d sess., S.Hrg. 103-835 (Washington, D.C.: U.S. Government Printing Office, 1994), 40-41, 43.

[12] For an account of the CWC negotiating endgame, see Amy E. Smithson, "Tottering Toward a Treaty," *Bulletin of the Atomic Scientists* 48, no. 6 (July/August 1992): 8-11; Amy E. Smithson, "Chemical Weapons: The End of the Beginning," *Bulletin of the Atomic Scientists* 48, no. 8 (October 1992): 36-40.

Union,[13] and Moscow continued to participate in the CWC negotiations amid worsening economic circumstances.

Before long, the CD negotiators recognized that economic difficulties would make it difficult, if not impossible, for Russia to meet the CWC's 10-year deadline to complete destruction of chemical weapons stockpiles. They quickly added a provision to the CWC to allow a treaty party to apply for a maximum five-year extension to complete the destruction of a stockpile.[14] In July 1992, the United States stepped in with $25 million in technical assistance for the Russian destruction program.[15] The negotiators also acknowledged that universal adherence to the CWC would take time. Therefore, they took the unprecedented step of building economic penalties into the CWC for states that do not join: Within three years after the CWC enters into force, nonparticipating states will lose access to some dual-use chemicals.[16]

In the end, the CWC's verification provisions were virtually identical to those in the BDA. Each called for data declarations, routine inspections, and challenge inspections. Under either treaty, inspectors have the authority to review a facility's records, interview personnel at the site, examine equipment, and take samples from such places as reactors, storage tanks, and waste streams. The CWC contains an explicit commitment to accept challenge inspections, and inspectors are to report any attempts to obfuscate or delay the progress of an inspection. Both accords require the destruction of former chemical weapons production facilities. However, a state may request permission to convert such facilities for peaceful uses. The conversion of a former production facility would be accompanied by stringent on-site inspections. While U.S. and Russian inspectors would implement the BDA, a new international monitoring agency, the Technical Secretariat, would be established in the Hague, the Netherlands, to administer the CWC and conduct its inspections.

When the CWC was opened for signature in mid-January 1993, Russia and the United States were among the initial signatories. Over 155 states quickly signed the CWC, so many assumed that it would not take long for 65 of those signatories to ratify the treaty and bring it into force. Considering Washington's role in creating the CWC, the United States was expected to be among the first to ratify.[17] Moreover, because the BDA was concluded three years before the CWC, most assumed that the BDA would be activated even before the CWC.

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[13] Yeltsin has made four separate public statements -- two January 1992 speeches and two declarations, in April 1993 and March 1995 -- about Russia's intent to abide by Soviet-signed arms treaties and destroy Russia's chemical weapons.

[14] Russia would submit its application for an extension to the Executive Council of the Organization for the Prohibition of Chemical Weapons (OPCW). This application must contain an explanation of why Russia needed additional time, as well as a detailed plan for accomplishing the destruction of the remaining weapons. If the request is approved, the OPCW will probably require additional verification measures. See the Chemical Weapons Convention, Annex on Implementation and Verification, Part IV (A), Section C, paragraphs 24-28.

[15] The United States and Russia signed an agreement regarding the safe, secure, and ecologically sound destruction of the Russian stockpile on 30 July 1992. In his essay, Maj. Gen. Roland Lajoie (USA, Ret.) provides much more detail about the efforts of the Cooperative Threat Reduction program regarding chemical weapons destruction in Russia. For information about other aspects of the what is also known as the Nunn-Lugar program, see The White House, "Safe, Secure Dismantlement (SSD) Initiatives with Russia," Fact Sheet (Washington, D.C.: Office of the Press Secretary, 4 April 1993).

[16] An overview of the CWC text is contained in Amy E. Smithson, ed., *The Chemical Weapons Convention Handbook* (Washington, D.C.: The Henry L. Stimson Center, 1993).

Events have not unfolded that way. In fact, over the past two years, parts of this carefully constructed architecture have appeared to be on the verge of unravelling. The intervening political and economic difficulties that would continue to complicate Russia's efforts to keep its pledges would not be the only factor blocking progress.

Problems Within Russia

Just as the finishing touches were being put on the CWC, clouds of suspicion began to gather over the complex of facilities dedicated to chemical weapons research, development, and production that Russia inherited from the USSR. Scientists who worked inside the Soviet chemical weapons complex charged that the USSR had sponsored a robust chemical weapons research, development, testing, and production program in the late 1980s and early 1990s.[18] During this same time period, the Soviet Union was participating in the negotiations to prohibit chemical weapons. Dr. Vil Mirzayanov contends that the Soviet Union's pledge to have halted chemical weapons production was broken when officials and technical experts at his scientific institute proceeded to develop a new generation of nerve agents. The "novichok" program focused on the development of binary chemical agents, which combine two chemical components just prior to detonation. According to Mirzayanov, the Soviets discovered, developed, tested, approved, and produced tens of tons of these new binary chemical agents. Not all of these activities, he says, ceased when the Russian government came to power.[19]

While it is worrisome—and politically damaging—that tens of tons of new binary agents may have been produced, the military significance of such quantities is questionable. For example, to defend a broad front for three days against a large-scale attack, 65 metric tons of VX would nominally be required to contaminate a strip of land that is 60 kilometers wide and 300 meters deep.[20] VX is a persistent nerve gas, meaning that it will remain operative for at least three days under good weather conditions. If a non-persistent agent like sarin or tabun were used, much larger quantities would be required for this one mission.[21] Russia has firmly denied the accusations of a covert binary program, taking full advantage of the gray area between development activities, which the CWC will prohibit once in force, and research, which will not be banned.[22]

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[17] Over 35 nations have ratified the CWC, including Austria, Australia, Finland, France, Germany, Greece, Japan, Mexico, Mongolia, Peru, Poland, Sweden, South Africa, Spain, Tajikistan, and Turkmenistan, among others.

[18] Dr. Vil Mirzayanov was joined by a former weapons designer, Vladimir Uglev, and another scientist, Lev Fyodorov, in charging that new chemical agents were developed. Gale Colby, "Fabricating Guilt," *Bulletin of the Atomic Scientists* 49, no. 10 (October 1993): 12-13.

[19] Mirzayanov's essay in this report provides greater detail on the novichok program.

[20] About 13,000 155-mm artillery rounds would be needed to deliver these 65 tons of VX. Contaminating an air base that is two square kilometers in size would require a total of 1.8 tons of VX, delivered in 0.3 ton increments by aircraft sorties twice a day for three days. These examples are taken from Anthony H. Cordesman's chart, "Typical War-Fighting Uses of Chemical Weapons," in his article, "One Half Cheer for the CWC: Putting the Chemical Weapons Convention in Military Perspective," in *Ratifying the Chemical Weapons Convention*, ed. Brad Roberts (Washington, D.C.: Center for Strategic and International Studies, 1994), 44. In this article, Cordesman analyzes the military significant and weaknesses of the CWC. On page 47, he states, "The weaknesses in the CWC are the kind of weaknesses that are unavoidable if any progress is to be made in negotiating and ratifying an effort to control chemical weapons. Although these weaknesses are sometimes significant, all can be contained or are of a nature that permits the faults of the CWC to be less threatening than a world without the CWC."

Because no independent confirmation of the whistleblowers' accounts has been possible, no one outside of Russia has evidence of just how far across this gray area the Soviet Union, and perhaps Russia, strayed. Furthermore, no actual treaty violation has taken place since neither the CWC nor the BDA are in force. At the very least, however, it would appear that the Soviet government mocked the objectives of both of these treaties and is likely have broken its 1987 public pledge to have stopped producing chemical weapons. As for the Russian government's complicity, it is not known how far bureaucratic inertia and support from reactionary forces inside the chemical weapons complex carried the novichok program despite Yeltsin's public oaths to abide by treaty commitments. What is known is that the very individuals who blew the whistle on the novichok program strongly believe that U.S. Senate ratification of the CWC will significantly increase the opportunities to get to the bottom of this matter.

The extent of these activities and the current status of this program has been a matter of controversy and concern to U.S. policy makers and Members of Congress. Also of concern are the statements that began to appear questioning the accuracy of the declared size of Russia's stockpile.[23] The United States has sought clarification of these matters through the Memorandum of Understanding, but with insufficient satisfaction. In the data exchanged in May and June of 1994, for example, Russia reportedly declared only one chemical weapons research site.[24] U.S. officials can push only so far for clarification under the Memorandum of Understanding because it is a cooperative, not a legally binding document.

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[21] On a windy and rainy day, VX coverage is expected to last from 1 to 12 hours. Sarin coverage is expected to last from 1/4 to 4 hours on a sunny day with light breezes and 1/4 to 1 hour in inclement weather conditions. For more of a layman's discussion of the persistency of chemical agents, see Gordon M. Burck and Charles C. Flowerree, *International Handbook on Chemical Weapons Proliferation* (New York: Greenwood Press, 1991), 579.

[22] Article VI of the CWC specifically allows states to produce and use a small quantity of toxic chemicals for research, medical, pharmaceutical, and protective purposes. Examples of medical and protective research include the development of vaccines and antidotes against chemical agents and the testing of protective equipment, like gas masks.

[23] For instance, Valery Menshikov, a consultant to the Russian Security Council, stated that Russia secretly destroyed an unknown quantity of chemical weapons because its stockpile was much larger than declared. Marcus Warren, "Russian Admits Deception on Chemical-Arms Stocks," *Washington Times*, 19 March 1994. Aleksey Yablokov, chairman of the Interdepartmental Commission for Ecological Safety of the Russian Security Council, stated that the figure of 40,000 tons was "very conservative." He added that the actual quantity of toxic substances may have been a whole order of magnitude larger. "News Chronology: February-May 1994," *Chemical Weapons Convention Bulletin*, no. 24 (June 1994): 24. The New York Times reported that "some Russian officials have hinted" that more than 40,000 tons was produced. Michael Gordon, "Moscow Is Making Little Progress In Disposal of Chemical Weapons," *New York Times*, 1 December 1993, A1.

[24] Interview by author, 23 May 1994. Phase II of the Memorandum of Understanding data exchanges took place in May and June 1994, followed by each side conducting five "practice" challenge inspections at declared government facilities from September to December of 1994. See Thomas W. Lippman, "Administration Voices Concern On Russian Treaty Compliance," *Washington Post*, 11 December 1994, A36; U.S. Arms Control and Disarmament Agency, *Adherence to and Compliance with Arms Control Agreements*, Report to Congress (Washington, D.C.: U.S. Arms Control and Disarmament Agency, 30 May 1995), 13.

U.S. negotiators have also relentlessly sought Russia's cooperation in bringing the BDA into force. Different reasons have been given for the less-than-enthusiastic response that U.S. overtures have received.[25] First and foremost among these reasons is the Russian government's reluctance to undertake obligations that it cannot afford. Firm cost estimates for Russia's destruction program are not available, but they start at about one billion dollars.[26] For a government struggling with an economic transition that has produced massive dislocation of its citizenry, the priorities between funding a weapons destruction program and housing and feeding its people are obvious.

Various Russian officials and legislators state that the Russian destruction program and ratification of chemical disarmament treaties are unlikely to move forward until Russia is confident that it has the financial means to fulfill its treaty obligations.[27] According to Dr. Alexander Pisarev of the Russian Embassy in Washington, D.C.:

> The Russian government fully understands that the main burden of destroying its chemical weapons stockpile will lay on Russia's shoulders. At the same time, however, the Russian government expects other signatories to the CWC to help at the outset of this destruction program. This expectation is especially high for the United States, which has promised assistance.[28]

Pisarev is referring to assistance that U.S. officials, including President Bill Clinton, have indicated would be forthcoming once U.S. experts were confident that the destruction methods proposed by Russia would meet treaty requirements.[29]

Given the complications that have been encountered over the last few years, Congress has only once approved additional funding—$30 million—for Russia's chemical weapons destruction program.[30] Another side-effect of the shortfall in funds available for destruction in Russia has been the revision of the BDA's schedules. If the BDA were to be enacted, destruction would begin by 30 June 1997 and end by 30 June 2004.

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[25] For example, when Congressman Glen Browder returned from a trip to Russia where he met with legislators as well as federal and local officials, he cited several reasons for lack of progress. He stated that "there is an apparently small faction that has reservations about the cost of destruction, the coverage of binary weapons by the CWC, the need to retain military utility of the [chemical weapons] stocks, the costs of CWC verification and inspection, and the possibility of non-signatories to the CWC on Russian and [Commonwealth of Independent States] borders." Representative Glen Browder, Memorandum to Representative Ronald V. Dellums, "July 3-10 Codel to Russia Concerning Chemical Weapons," 25 July 1994.

[26] These cost estimate vary widely. Arguing for the CWC's ratification before the State Duma, Maj. Gen. Yuri Tarasevich told the representatives that it cost roughly $3 million a year to store the chemical weapons, but it would cost about $1.2 billion to destroy the stockpile. Tarasevich is the deputy head of the Radiation, Chemical and Biological Protection Troops. "News Chronology: February-May 1994," *Chemical Weapons Convention Bulletin*, 24. On 1 April 1995, the chairman of the presidential committee, Pavel Syutkin estimated the cost of destroying the Russian arsenal at $5 to $6 billion. "New Chronology: February-May 1995," *Chemical Weapons Convention Bulletin*, no. 28 (June 1995), 24. In comparison, destruction of the U.S. stockpile is estimated to cost just under $12 billion.

[27] Catherine Toups, "U.S. Russia Slow to Destroy Chemical Weapons After Vow," *Washington Times*, 31 January 1995.

[28] Dr. Alexander Pisarev, interview by author, Washington, D.C., 12 September 1995.

[29] At the January 1994 Moscow summit, Clinton pledged to consider additional U.S. assistance for Russia's destruction program. "News Chronology: November 1993-February 1994," *Chemical Weapons Convention Bulletin*, no. 23 (March 1994): 21. Russia plans to use a two-step process, chemical neutralization followed by bitimunization. Early results from joint testing of this approach in the United States are promising. Joint tests continue at Saratov. For more detail, see Maj.Gen. Roland Lajoie's (USA, Ret.) essay in this report.

The second reason cited for lack of progress relates to the Presidential Committee for Convention-Related Chemical and Biological Weapons Matters that Yeltsin created in February 1992 to oversee the destruction program. Because those who build something often have the most knowledge about how to destroy it, Yeltsin appointed veterans of the Soviet chemical weapons complex to this committee. Similarly, the U.S. Army Chemical Corps, which ran America's programs to develop and produce chemical weapons, is now managing the destruction of the U.S. arsenal. In Russia's case, however, some members of Russia's chemical corps and chemical industry are sympathetic to reactionaries who want to revert to Communist practices. Many of these individuals spent a lifetime building the Soviet chemical weapons program, and they perceive proposals to destroy the stockpile as a threat to their jobs and a negation of their careers. Accustomed to the structure and control of the Soviet Union's planned economy, many of these managers are also ill at ease with the uncertainties brought about by Russia's economic and political transition. Therefore, some of the very people that Yeltsin asked to supervise the destruction of the Russian stockpile have stalled progress on that front.

A third reason that little headway has been made is that proposals to destroy the Russian stockpile have run into strong resistance from people living near prospective destruction sites. In 1988, frightened citizens near the USSR's pilot destruction plant at Chapayevsk protested so vehemently that the Soviet government was forced to turn it into a training facility.[31] Grassroots apprehension that chemical weapons destruction would endanger public health and the environment was not dampened by Yeltsin's promise to improve health care and other services in communities where destruction facilities would be built. Also, many of these people apparently did not know what was being stored in their midst until recently.[32] The location of Russia's stockpile storage sites was only made public in January 1994.[33]

The commission's initial proposal for the stockpile's destruction, which involved transporting chemical weapons through densely populated areas along "technically and structurally unsafe" rail lines, was heavily criticized.[34] The commission itself became suspect. On 8 April

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[30] In 1994, Congress added another $30 million for the construction of an analytical laboratory to support this destruction program.

[31] Igor Khripunov, "The Human Element In Russia's Chemical Weapons Disposal Efforts," *Arms Control Today* 25, no. 6 (July/August 1995): 18.

[32] Such was the case with the local leaders at a stockpile storage site visited by Congressman Glen Browder (D-Alabama) in mid-1994. Interview with Glen Browder, Washington, D.C., 14 September 1995.

[33] Igor Vlasov, "Chemical Splinters in Russia's Body," *Rossiiskaya Gazeta*, 15 January 1994, 3.

[34] Initial plans set aside 13 percent of the cost of the program's first phase for housing and other infrastructure improvements. For more on this proposal, which was made to the Supreme Soviet in the fall of 1992, see Khripunov, "The Human Element In Russia's Chemical Weapons Disposal Efforts," 18-19.

1994, Yeltsin issued a one-line statement firing its chairman, retired Gen. Anatoly Kuntsevich, for "numerous and gross violations" of his duties.[35]

Another reason that has thwarted progress is that U.S. officials have had difficulty pinpointing just which organization in the new Russian government has the principal authority for these matters. Among the organizations involved are the Ministry of Defense, the Ministry of the Interior, and the Ministry of Foreign Affairs. At various times U.S. officials found that one organization, then another, appeared to be in charge of the destruction program or a particular facet of it. Well over a year passed before Pavel Syutkin was confirmed as Kuntsevich's replacement as chairman of the presidential committee. This situation appears to have improved with Yeltsin's 24 March 1995 formation of a new interministerial committee that will report to his National Security Advisor, Yuri Baturin, who is to coordinate the activities of the different departments involved.[36] Yeltsin's order also firmly stated that Russia's chemical weapons would be destroyed at the seven sites where they are stored.

Moscow's willingness to work with U.S. officials has noticeably increased since the Russian government has succeeded in negotiating agreements granting local governmental approval for work on the destruction program to proceed in three of the seven stockpile communities. Agreements are now in place for Gorny, Kambarka, and Shchuche.[37] On 16 September 1995, Yeltsin took another important step in creating the governmental infrastructure to execute this program when he submitted a draft law on the destruction of Russia's chemical weapons to the Duma's Defense Committee.[38] Duma passage of this law will remove a major obstacle impeding Russian ratification of the CWC.

A final suggested reason for sluggish progress is that Russia's travails in putting together a coherent destruction program may simply be a cover to hide the novichok binary program. According to this school of thought, hardliners within the Russian government have been holding off the entry into force of the BDA and the CWC to enable the continued production of new chemical weapons and/or to conceal evidence of the novichok program. The veracity of this theory cannot be tested without the on-site inspections enabled by the BDA or the CWC.

A related school of thought submits that stalling allows Russia to convert its chemical weapons production facilities to the manufacture of commercial products without U.S. or international supervision. How to convert former production facilities for peaceful purposes has been a staple of bilateral discussions for the past few years. U.S. policy makers have argued that

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[35] Richard Boudreaux, "Yeltsin Fires Chemical Warfare Chief," *Los Angeles Times* (8 April 1994). No further specification of the charges against Kuntsevich was provided.

[36] "News Chronology: February-May 1995," *Chemical Weapons Convention Bulletin*, no. 28 (June 1995): 23.

[37] Khripunov, "The Human Element," 19-20. This summer, local officials near Shchuche signed a legal document granting Moscow authorities permission to start surveying for the exact site for a destruction facility.

[38] This legislation contains the comprehensive plan to destroy the stockpile, which is the foundation that must be in place before Russia can ratify the CWC. Presidential Press Service, Moscow, 18 September 1995.

Russia is trying to weaken the terms for destruction or conversion of these facilities.[39] Russian officials counter that the costs of all of the possible attendant verification procedures are prohibitive. They also observe that Russia's economy suffers if these facilities, which could be making commercial products, must remain closed until the BDA or the CWC become effective.

One does not have to search too hard to see that the actions of Moscow and Washington on this important security matter remain closely linked. The Duma has held hearings on the CWC. In October 1994, the Duma's Committee on Defense stated that "Chemical disarmament meets in full measure the national interests of Russia."[40] However, the Duma cannot act on the treaty until Yeltsin formally submits it for consideration. Yeltsin is unlikely to take this step until the funding picture for chemical weapons elimination becomes clearer. On the opposite side of the Atlantic, the Senate held numerous hearings on the CWC in 1994, but has taken no action since. Congress is also reticent to approve additional funds to help Russia's destruction program. Some in Congress argue that Russia must answer all questions about the novichok program before the United States takes additional steps: Russian policy makers counter that the United States should provide the promised assistance before Russia takes additional action. Each side is thus waiting for the other to move first.

The Pursuit of U.S. National Security Interests

When the Senate debates the CWC, some are likely to claim that a decision on the CWC has to be predicated upon the progress or lack thereof that has been achieved through bilateral chemical weapons agreements with Russia. Those who insist on clinging to this approach mistake the appetizers for the entree. The CWC is best suited to help the United States reach its near-term objective to resolve problems in Russia and its long-range objectives regarding nonproliferation policy and chemical weapons disarmament.

Some of the most important decisions pertaining to chemical weapons disarmament in Russia are to be taken in Moscow, but the decisions made by the U.S. Senate can influence what unfolds in Russia. The U.S. Senate's actions can either make it less complicated for Russia to proceed along a constructive path or easier for Russia to go in the wrong direction. The decisions facing the Senate are whether ratification of the CWC and the provision of additional U.S. resources for the destruction of Russia's chemical arsenal would increase the probability that Moscow chooses a desirable course. Ratification of the CWC and the provision of additional U.S. resources for the destruction of Russia's chemical arsenal are strong incentives for Russia to do so.

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[39] For example, both agreements state that inspectors can "observe all areas, all activities, and all items of equipment at the facility," take samples from "any area," and use "continuous monitoring with on-site instruments and the physical presence of inspectors." See Amy E. Smithson, "Russia Wants Plastics, Too," *Bulletin of the Atomic Scientists* 50, no. 3 (May/June 1994): 14-15. Lack of progress on bilateral issues has spilled over to the CWC's Preparatory Commission, slowing to a crawl decision making about the operational details of the CWC's declarations, inspections, and administration.

[40] Committee on Defense, Federal Assembly of the Russian Federation, State Duma, "On the Course of Preparation of the Russian Federation for the Process of Destruction of Chemical Weapons and for Ratification of the 'Convention on the Prohibition of Development, Production, Stockpiling and Use of Chemical Weapons and On Their Destruction'," (Moscow, 31 October 1994), 2.

Those still fixated upon the problem and not the solution will argue that the United States should take no action on the CWC until Russia "comes clean" about the novichok program under the Memorandum of Understanding. This argument is self-defeating, because U.S. decision makers will not truly know whether Russia has been totally forthcoming in declaring its activities until inspections are conducted. Suspicions require on-site inspections. Russia can only be held accountable under a legally binding agreement. The Memorandum of Understanding is not such an agreement; the CWC is.

Some will also contend that the BDA must be activated before the CWC is ratified and enters into force. Actually, Russia accrues several advantages in enacting the BDA first. According to the March 1993 draft Protocol of the BDA, the *inspecting* party agrees to "bear the expenses related to inspection activities..., including the installation and maintenance of agreed equipment."[41] Thus, the financial burden on the Russian government would be less under the BDA since under the CWC Russia will be assessed a constant share of the budget for the Technical Secretariat.[42] While the United States is more accustomed to working bilaterally with Russia on sensitive military issues, there is no reason other than Russia's financial plight why the BDA must precede the CWC, especially since the verification provisions under the two accords are virtually identical.

The largest risk that the U.S. Senate runs in ratifying the CWC before Russia is that Russia will not quickly follow suit. Even so, the United States would occupy the high ground of having helped to reinforce an international norm against chemical weapons development, production, and stockpiling—the very activities that the United States long ago ceased unilaterally. Until the U.S. Senate gives its consent to ratification of the CWC, it will be in the untenable position of complaining about possible activities in Russia that may violate a law that does not exist.

No matter how detailed a map Mirzayanov and other whistleblowers provide to the novichok program, without the CWC that map will be of little avail. Until the CWC is in force, inspectors will be denied the opportunity to take the measure of what agents may or may not have been developed. Given the information already available about the novichok program, those within Russia's chemical weapons complex will be hard-pressed to foil the CWC's routine and challenge inspections as long as the international Technical Secretariat is doing its job properly. If an effort is made to take the binary program underground, so to speak, trying to hide it amidst the background noise of commercial chemical industry, Russia would be subject to findings that it has violated the CWC's prohibition on the use of any toxic chemicals for military purposes. Unless the CWC is in force, Russia's commercial activities with dual-use chemicals will remain undeclared and unmonitored.

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[41] Emphasis added. Protocol on Implementation Measures Relating to the Agreement Between the United States of America and the Union of Soviet Socialist Republics on the Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons, 26 March 1993 Joint Draft Text, I(D)3(c).

[42] Russia's assessment for Preparatory Commission activities is 5.67 percent, slightly smaller than Russia's 5.68 percent assessment for United Nations activities. Preparatory Commission Document PC/VII/A/4 (The Hague: OPCW Preparatory Commission, 23 September 1994), 4, 8.

Moreover, refusal of a challenge inspection would automatically put Russia in violation of the CWC. Inspectors will have two basic strategies to assess whether Soviet authorities produced novel chemical agents that are not banned by the CWC.[43] First, all chemical agents are made from the same chemical building blocks—sulfur, phosphorus, or flourine. Inspectors can analyze samples they have taken for the chemical agent precursors that the CWC controls, as well as the chemical by-products that result when a chemical solution degrades over time. This analysis will give inspectors insight into whether new agents were produced. Second, the inspectors will look for evidence of novel chemistry, which would require the modification of standardized equipment. While interviewing workers and reviewing facility records, they will also look for anomalies, which will be reported if Russian officials have no satisfactory explanation.

Even though inspectors have been able to confirm the presence of chemical weapons years after their use occurred,[44] pragmatists will not expect the inspection process to produce immediate, clear-cut answers. Nonetheless, the United States stands to learn a great deal more about the novichok program from the CWC's inspections than it would otherwise glean through national technical means.

Similarly, the best route to watch over Russia's conversion of former chemical weapons production facilities is through the CWC. Before long, however, this particular issue may be moot. Earlier this year, a senior Russian official announced that "Russia has proceeded to destroy" over half of its chemical weapons production facilities to further the "definitive elimination of the military chemical threat" and demonstrate Russia's commitment to the CWC.[45] The longer the U.S. Senate delays ratification of the CWC, the more former Russian production facilities will be converted without international supervision. In contrast, with the CWC the opportunity arises to monitor this conversion process closely, confirming the elimination of specialized equipment and structures.

Proper implementation of the CWC would also bolster accountability for Russia's chemical weapons stockpile. International inspectors have the right to inventory, secure, and routinely check Russia's arsenal until it is destroyed. In this manner, the CWC's monitoring process can help prevent Russian chemical weapons from finding their way into the hands of proliferators or terrorists.

As for further assistance to Russia's chemical weapons destruction program, some will argue that taxpayers dollars should not be used to help fulfill Russia's treaty obligations. However, tightening security around Russia's chemical weapons stockpile and hastening its destruction will measurably reduce the possibility that Russian chemical weapons will one day harm Americans.[46] As one person who had been to Russian chemical weapons storage facilities concluded, "The best security is to get rid of it."[47] Any additional funding would probably fall under the umbrella of the Nunn-Lugar Cooperative Threat Reduction Program, which was initiated in the aftermath of the Soviet Union's disintegration to help secure and dismantle the former Soviet Union's weapons of mass destruction. Congress might also recall that whatever assistance the United States provides would simultaneously benefit the U.S. companies awarded the contracts for this work.[48]

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[43] Note that the CWC's list of prohibited agents, as well as the control lists of dual-use chemicals, can be modified.

[44] Soil samples taken from four year-old bomb craters in Iraq had traces of the nerve gas sarin and the blister agent mustard, confirming Iraq's violation of the 1925 Geneva Protocol ban on the use of chemical weapons. See "Scientific First: Soil Samples Taken from Bomb Craters in Northern Iraq Reveal Nerve Gas -- Even Four Years Later," Physicians for Human Rights/Human Rights Watch (Boston, 29 April 1993); *Report on Analysis of Samples Collected in Northern Iraq* (Porton Down, United Kingdom: Chemical & Biological Defence Establishment, Ministry of Defence, March 1993).

[45] "Statement by the Head of the Delegation of the Russian Federation at the Eleventh Session of the Preparatory Commission for the Organisation for the Prohibition of Chemical Weapons," Document PC-XI/11 (The Hague: Preparatory Commission for the Organisation for the Prohibition of Chemical Weapons, 25 July 1995).

The United States cannot be expected to pay for most of these expenses, and that does not appear to be what Russian officials are requesting. Russia has asked for assistance in getting its destruction program *started*. Through incremental funding, Congress can significantly facilitate this process. Western technical credibility as well as money are important here. Wary of a chemical Chernobyl, Russian citizens will have more confidence that chemical weapons destruction can be accomplished safely with Western technical assistance and oversight. Local communities are more likely to cooperate with Moscow if the United States stays involved in Russia's chemical weapons destruction program.[49] Already, other countries, recognizing Russia's severely depressed economy and the threat resident in Russia's chemical weapons stockpile, have begun offering financial and technical assistance. Germany, for example, is helping to develop technology to destroy the mustard and lewisite agents at the Gorny storage site. Sweden has pledged assistance, and internal discussions are taking place in other European capitols about how they might help the Russian destruction program.[50] Thus, the United States would have partners in this effort.

In sum, the Senate will have little effect on the problems associated with Russia's chemical weapons complex by sitting on the sidelines. Ratification of the CWC and increasing U.S. assistance for the destruction of Russia's chemical arsenal are sensible steps to begin resolving these problems.

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[46] According to Browder, "Destruction of these weapons will be a very worthwhile investment in improving U.S., Russian, and international security." Browder, "July 3-10 Codel to Russia Concerning Chemical Weapons," 25 July 1994.

[47] Interview by author, 28 July 1995.

[48] For a similar argument, see Secretary of Defense William Perry's win-win-win concept, as quoted in Dunbar Lockwood, "The Nunn-Lugar Program: No Time To Pull the Plug," *Arms Control Today* 25, no. 5 (June 1995): 10. These funds should not, however, be used to construct hospitals, roads, or make other improvements that Moscow has promised local communities for their cooperation with the destruction program.

[49] Congressman Browder discussed this matter with Russian officials in 1994. In his trip report, he states "It was also apparent in frank discussions with local and regional civilian officials that active American-Russian partnership in [chemical weapons] destruction will help move the program along among local site populations." Browder, "July 3-10 Codel to Russia Concerning Chemical Weapons," 4.

[50] Interview by author, 15 September 1995. Sweden has pledged 2.6 million Krona (approximately $370,000) to assist destruction at the Kambarka site. "News Chronology: November 1994-February 1995," *Chemical Weapons Convention Bulletin*, no. 27 (March 1995), 28-29.

Furthermore, the CWC will promote the long-term U.S. nonproliferation objectives by helping to reverse the tide of chemical weapons proliferation. Undoubtedly, the time has come for the U.S. Senate to act.

Appendix: Chronology of Events Related to U.S. and Soviet/Russian Chemical Weapons Disarmament

Laurie H. Boulden

1960	Negotiations for an international chemical weapons ban begin in Geneva.
1969	The United States ceases production of unitary chemical weapons.
1979	The U.S. Army constructs a new chemical agent disposal facility at the Tooele Army Depot, Utah, to test high-temperature incineration as well as neutralization. From 1979 to 1987, the Army incinerates over 83 metric tons of chemical agents and nearly 38,000 munitions.
9 March 1982	After encountering difficulties with neutralization, the U.S. Army selects the incineration method to destroy the stockpile.
18 April 1984	At the Conference on Disarmament (CD) in Geneva, Vice President George Bush presents a draft text of the Chemical Weapons Convention (CWC) banning the development, acquisition, production, stockpiling, transfer, and use of chemical weapons. His proposal calls for any time, any place challenge inspections of facilities suspected of engaging in banned activities. The Soviet Union quickly dismisses the U.S. proposal.
1984	The U.S. National Research Council (NRC) Committee on Demilitarizing Chemical Munitions and Agents reviews a range of U.S. chemical weapons disposal techniques and endorses the Army's selection of incineration, the so-called "baseline" approach.
1985	The Soviet government selects Chapayevsk as the site for a chemical weapons destruction facility.
November 1985	U.S. Public Law 99-145 directs the Department of Defense to destroy over 95 percent of the total U.S. stockpile of chemical agents and munitions by 30 September 1994. The Army estimates the total cost for destruction will be $1.7 billion. This figure rises to $8.6 billion in 1993.
1986-1989	The Soviet government operates Chapayevsk as a demonstration facility using the KUASI 2-step destruction technology, which neutralizes the chemical agent with an organic reagent and then incinerates the resulting mass.

10 April 1987	In Prague, Soviet Premier Mikhail Gorbachev announces that the Soviet Union has stopped producing chemical weapons and has never deployed any outside of its own territory.
6 August 1987	At the CD, the Soviet Union accepts the principle of challenge inspections without the right of refusal, resolving a major impasse in CWC negotiations.
4 October 1987	Western observers from 45 countries visit the Soviet chemical weapons testing facility at Shikhany. They examine the facility and the chemical weapons to be destroyed.
23 February 1988	The Under Secretary of the U.S. Army announces that chemical weapons will be incinerated at the eight sites where they are stored. This alternative was selected over transportation options because a more credible emergency response program could be established at the storage sites rather than along transportation corridors that would be used to relocate the weapons to one or two central destruction facilities.
28 July 1988	At the CD, the United States voluntarily reveals the location of its chemical weapons storage facilities and its plans to eliminate the U.S. chemical weapons arsenal. The U.S. delegation calls on the Soviet Union to do the same.
23 September 1989	The Soviet Union and the United States sign the Wyoming Memorandum of Understanding (MOU) to build confidence that a chemical disarmament treaty can be successfully implemented. The MOU consists of two phases of data exchanges and trial on-site inspections.
5 September 1989	Due to public protests about safety at the Chapayevsk destruction facility, Soviet Government Decision #1565 turns Chapayevsk into a training facility.
29 December 1989	Phase I of the Wyoming MOU data exchange takes place. The United States and the Soviet Union swap data on aggregate stockpile size; types of agents; the percent of chemical agents in munitions, devices, or bulk storage; the location of storage, production, and destruction facilities; and types of agents and munitions at each. The Soviet Union declares the size of its chemical stockpile to be 40,000 metric tons.
7 February 1990	U.S. Secretary of State James Baker and Soviet Foreign Minister Edward Shevardnadze agree on a framework document to help accelerate CWC negotiations at the Conference on Disarmament. This document outlines plans for a bilateral destruction agreement.
1 June 1990	The United States and the Soviet Union sign the "Agreement on Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Chemical Weapons Convention," known as the Bilateral Destruction Agreement (BDA). In this accord, both sides pledge to cease chemical weapons production, to reduce existing stocks to 5,000 metric tons

by the end of 2002, to cooperate on safe technologies for destruction, and to allow on-site inspections during the destruction process. Complications caused by the collapse of the Soviet Union later spur a renegotiation of the BDA's timelines, with destruction slated to begin in 1997 and end by 2004.

30 June 1990	The U.S. Army begins testing its pilot destruction facility at Johnston Atoll in the Pacific. These tests involve M-55 rockets and 105mm M-60 projectiles filled with chemical agents.
February 1991	Phase I of the Wyoming MOU comes to a close. The Soviet Union and the United States successfully conducted reciprocal trial inspections at two production, three storage, and two industrial chemical facilities.
13 May 1991	President George Bush announces a U.S. initiative to propel the CWC negotiations toward conclusion. The United States commits unconditionally to destroy all of the U.S. stockpile within 10 years of the CWC's entry into force. The United States also renounces *any* use of chemical weapons, including use in retaliation for a chemical attack, once the CWC becomes effective and providing the USSR is a participant in the treaty.
10 October 1991	Dr. Vil Mirzayanov, a scientist at the Soviet State Institute for Organic Chemistry and Technology (GosNIIOKhT), the Soviet Union's premier chemical weapons research facility, publishes an article in the newspaper *Kuranty*. He charges that the Soviet Union has continued to develop, test, and produce chemical weapons.
19 August 1991	A *coup d'etat* almost topples the Soviet government.
25 December 1991	Gorbachev announces the imminent termination of the Soviet government. As the new year dawns, the flag of the Federation of Russia is raised over the Kremlin.
6 January 1992	Mirzayanov is fired from his job at GosNIIOKhT because of his revelations about the "novichok" program to develop a new generation of binary chemical weapons.
19 February 1992	Russian President Boris Yeltsin's Presidential Decree #160 creates the "Presidential Committee for Convention-Related Chemical and Biological Weapons Matters" to oversee Russian treaty compliance, including the chemical weapons destruction program.
30 July 1992	The United States and Russia sign an agreement concerning the safe, secure, and ecologically sound destruction of chemical weapons. This agreement initiates such activities as joint training in chemical weapons destruction methods and other efforts designed to facilitate Russia's destruction program. The United States pledges $25 million in technical assistance.

10 August 1992	After more than three decades, CWC negotiations come to a successful conclusion at the CD in Geneva.
16 September 1992	With Lev Fyodorov, Mirzayanov publishes an article about the novichok binary program in *Moscow News*. Mirzayanov conducts interviews with western journalists, which result in international press coverage of this story.
October 1992	The Presidential Committee submits a draft proposal to the Duma for the phased destruction of the Russian stockpile, based on an earlier Yeltsin decree supporting a phased approach. Phase I calls for the on-site destruction of blister agents at Kambarka and Gorny. In Phase II, nerve agent-filled munitions from Kizner and Shchuche are to be transported for destruction to a facility in Novocheboksarsk, Chuvash Republic.
2 October 1992	Tartarstan declares itself a weapons of mass destruction (WMD)-free zone, outlawing any production, storage, or movement of WMD on its territory. This action makes it impossible to execute the Presidential Committee's plan to transport chemical weapons from Kizner and Shchuche to Novocheboksarsk for destruction.
22 October 1992	Russian authorities arrest Mirzayanov and place him in Lefortovo Prison in Moscow. He is charged with revealing state secrets, but claims his arrest violates the Russian constitution.
1 November 1992	Mirzayanov is released from prison and awaits trial.
25 December 1992	The Chuvash Supreme Soviet forbids chemical weapons destruction within its borders, thus outlawing the destruction facility planned for Novocheboksarsk.
13-15 January 1993	In Paris, Russia and the United States join 130 other countries in becoming initial signatories to the CWC.
19 January 1993	The Duma rejects the Presidential Committee's draft destruction program, citing strong regional opposition to the transportation of chemical weapons from storage facilities to destruction sites.
March 1993	The Duma asks the government and the Presidential Committee for a more detailed plan for destruction.
26 March 1993	In Moscow, negotiations to conduct Phase II of the Wyoming MOU conclude successfully.
June 1993	The United States establishes the Chemical Weapons Destruction Support Office in Moscow to facilitate U.S. assistance to the Russian destruction program.

10 August 1993	A new commission, headed by First Vice Premier Oleg Soskovets, is created to recommend destruction sites to Yeltsin and to work to secure the local community's approval of a facility.
11 August 1993	The U.S. Army opens the $385 million Tooele baseline destruction facility at Tooele, Utah, and begins to test its equipment in preparation for trial burns to prove that the incinerators can meet pollution control standards.
September 1993-March 1994	Russian scientists visit the United States for March 1994 training at U.S. chemical weapons sites, mostly at the training facility in Aberdeen, Maryland. They also work with U.S. citizens' groups to learn about the legal, political, and public aspects of running a destruction program.
22 October 1993	In an interview with *Krasnaya Zvezda*, former chairman of the Presidential Committee, Anatoly Kuntsevich, states that no agencies or ministries of the Russian government have complete information on the amount or location of previously disposed chemical weapons-related materials.
3 November 1993	Kambarka's city and regional councils approve the placement of a chemical weapons destruction site there, in exchange for Moscow's pledge of 6 billion rubles for infrastructure projects, including better water and gas supplies and a sewage treatment facility.
23 November 1993	President William Clinton submits the CWC to the Senate for its advice and consent to ratification.
14 January 1994	At a summit in Moscow, President Bill Clinton promises to consider additional measures to assist Russia's chemical weapons destruction program. Clinton and Yeltsin sign a document initiating Phase II of the Wyoming MOU.
15 January 1994	*Rossiiskaya Gazeta* reveals the location of the seven sites in Russia where chemical weapons are stored. This information was previously classified.
27 January 1994	Mirzayanov is arrested again, only to be released from prison 26 days later.
4 February 1994	The NRC Stockpile Committee issues recommendations on U.S. chemical demilitarization. The NRC concludes that the Army's incineration method has been demonstrated to be a safe and effective disposal process. Although supporting continued research on alternate techniques, the NRC states that the benefits of developing another successful technique are outweighed by the risks associated with the many years of storage needed to develop alternate techniques fully.
March 1994	Congress adds $30 million for the construction of a laboratory to support Russia's destruction program.

11 March 1994	The Russian government drops its legal case against Mirzayanov due to lack of evidence.
17 March 1994	According to the London *Daily Telegraph*, Valery Menshikov, a consultant for the Russian Security Council, asserts that Russia secretly destroyed an unknown quantity of chemical weapons in 1993 without international monitoring. This destruction activity, he explains, was intended to reduce the Russian stockpile to the declared level of 40 000 metric tons.
24 March 94	The head of the Foreign Ministry's arms control department, Oleg Sokolov, states that Russia's interests require it to become one of the first 65 signatories to ratify the CWC, and that the "negative implications from Russia's failure to do so are obvious."
7 April 1994	Chairman of the Presidential Committee Anatoly Kuntsevich is fired by Yeltsin for "numerous and gross" violations of his duties.
May 1994	Under the aegis of the U.S. technical assistance program, the Department of Defense awards a contract to Bechtel National, Inc. to prepare a comprehensive implementation plan for Russian chemical weapons destruction.
May-June 1994	Russia and the United States exchange data under Phase II of the Memorandum of Understanding.
8 June 1994	The People's Court of Moscow awards Mirzayanov 30 million rubles in compensation for his arrests and trial. To date, he has not received any compensation.
16 September 1994	*Obshchaya Gazeta* prints details about Russian chemical weapons destruction plans, including a Defense Ministry concept paper. Russian experts were most angered by their government's seeming disregard for public opinion in making decisions about chemical demilitarization.
31 October 1994	The Russian Duma Committee on Defense states that "Chemical disarmament meets in full measure the national interests of Russia."
18 November 1994	The United States and Russia sign the "Addendum to the 1994 Plan of Work for Assistance to the Russian Program for the Destruction of Chemical Weapons within the Framework of the Bilateral Agreement of 30 July 1992," which provides for the joint evaluation of Russian destruction technologies and plans.
22 November 1994	A Russian team arrives in the United States to inspect Newport Army Ammunition Depot in Indiana. This trial inspection is one of five that Russian officials conduct at declared U.S. government chemical weapons facilities in Phase II of the Wyoming MOU. During this general time period, U.S. inspectors also inspect five sites in Russia.

5 December 1994	At a news conference sponsored by Greenpeace in Moscow, Lev Fyodorov, Chairman of the Russian Union for Chemical Security, states that 4.5 million chemical weapons have been dumped in the seas surrounding Russia since World War II. The chairman of the Saratov Union for Chemical Safety, Vladimir Petrenko, announces that Russian officials engaged in the "unauthorized destruction" of chemical weapons at Shikhany in 1993.
7 December 1994	A new Yeltsin order supersedes one from September 1992 about controls on the export of dual-use chemicals, technology, and equipment. Export controls in the new order are more stringent.
8 December 1994	GosNIIOKhT countersues Mirzayanov for 33 million rubles.
10 December 1994	Phase II of the Wyoming MOU comes to a close with the completion of the final reciprocal trial inspections.
14 December 1994	The Chechen Parliament accuses the Russian government of using chemical weapons against them in the military conflict in Chechnya.
30 December 1994	Russian Government Decision #1470 provides 36 billion rubles (approximately $9 million) to Gorny for infrastructure improvements, in exchange for local cooperation with the destruction facility to be built there.
6 January 1995	Russian Duma Deputy Ayvars Lezdinsh tells reporters that Federal troops used chemical bombs to contaminate the Chechen reservoir at Grozny during the conflict in Chechnya.
21 January 1995	Sweden pledges 2.6 million Krona (approximately $370,000) in financial aid to Russia to assist with chemical weapons destruction at Kambarka.
4 February 1995	The Union for Chemical Safety reports that one-half of the 3,000 workers employed at the chemical weapons production factory in Novocheboksarsk have been or are ill.
February 1995	The Russian destruction plan is reshaped. Nerve agent-filled munitions now will be destroyed in Phase I.
22 March 1995	Upon the authority of Russian Prime Minister Viktor Chernomyrdin, Russian Government Decision #289 announces the "organization of work" for the destruction of lewisite at Kambarka, authorizing the Ministry of Defense to coordinate the project.
24 March 1995	Yeltsin issues Presidential Decree #314 "On Preparing the Russian Federation for the Implementation of International Commitments in the Field of Chemical Disarmament" to accelerate and organize Russia's demilitarization efforts. This decree creates an interagency commission to oversee chemical weapons destruction, chaired by National Security Adviser Yuri Baturin, and delineates a list of tasks for all relevant agencies involved in destruction.

	Yeltsin also issues a decree giving Pavel Syutkin, the new chairman of the Presidential Committee, 60 days to plan measures to accelerate preparations for chemical weapons destruction.
11 April 1995	Chairman of the Duma Defense Committee Alexander Piskunov states that the Russian Federation will not be among the first 65 states to ratify the CWC because of economic pressures and the upcoming parliamentary elections.
July 1995	The Russian government and the Shchuche local government sign a protocol authorizing the location of a pilot chemical weapons destruction facility in Shchuche.
5 September 1995	In an official statement, Clinton welcomed the adoption of a Senate amendment, sponsored by Senator Carl Levin (D-MI), which expresses the Senate's desire to ratify the CWC quickly.
16 September 1995	Yeltsin submits draft legislation to the Duma containing the revised comprehensive plan to destroy the stockpile.

Sources

Busbee, Walter. "Now for the Heavy Lifting: Destroying CW Stockpiles in the United States and Russia." In *Ratifying the Chemical Weapons Convention*, edited by Brad Roberts, 105-115. Washington, D.C.: Center for Strategic and International Studies, 1994.

Harvard/Sussex Program on CBW Armament and Arms Limitation. *The Chemical Weapons Convention Bulletin*.

Khripunov, Igor. "The Human Element in Russia's Chemical Weapons Disposal Efforts." *Arms Control Today* (July/August 1995): 16-21.

Lajoie, Maj. Gen. Roland (USA, Ret.). "Cooperative Threat Reduction Support to the Destruction of Russia's Chemical Weapons Stockpile." In *Chemical Weapons Destruction in Russia: Problems and Prospects*, edited by Amy E. Smithson, 35-47. Washington, D.C.: The Henry L. Stimson Center, October 1995.

Lenihan, Maureen. "Appendix B: U.S. Chemical Demilitarization Chronology." In *The U.S. Chemical Weapons Destruction Program: Views, Analysis, and Recommendations*, Amy E. Smithson with the assistance of Maureen Lenihan, 95-104. Washington, D.C.: The Henry L. Stimson Center, September 1994.

Smithson, Amy E., ed. *The Chemical Weapons Convention Handbook*. Washington, D.C.: The Henry L. Stimson Center, September 1993.

U.S. Arms Control and Disarmament Agency, Fact Sheet: Chronology of Events Leading to the Signing of the Chemical Weapons Convention. Washington, D.C.: U.S. Arms Control and Disarmament Agency, 5 January 1993.

About the Project

The Chemical Weapons Convention (CWC) is a multilateral treaty of unprecedented scope and complexity that will prohibit the development, production, acquisition, stockpiling, retention, and use of chemical weapons. In conjunction with the CWC's signing ceremonies in January 1993, the Stimson Center launched a project to monitor domestic and international preparations for implementing the treaty and to serve as an information clearinghouse.

The project publishes a periodic newsletter—The CWC Chronicle—to keep officials in government, industry, the diplomatic community, and interested observers abreast of important developments related to the CWC's implementation.

The project assembled a group of experts from the International Atomic Energy Agency (IAEA), which is the oft-cited model for the CWC's new international monitoring agency, to consider what steps they would take and which ones they would avoid if they were building a monitoring agency from scratch. Their warnings and recommendations were published in an occasional paper, *"Administering the Chemical Weapons Convention: Lessons from the IAEA"* (April 1993).

A guidebook, titled *"The Chemical Weapons Convention Handbook,"* (September 1993) walks readers through the basic components of the treaty using a thorough, reader-friendly question and answer format. The handbook also provides discussion of such topics as the verification regime and stockpile destruction, as well as a selected bibliography.

Given the CWC's significant reporting and inspection requirements for commercial chemical industry, the project gathered a group of industry experts to solicit their thoughts about these requirements. Their views about the treaty and recommendations to facilitate the effective implementation of the CWC are contained in *"Implementing the Chemical Weapons Convention: Counsel from Industry"* (January 1994).

A report entitled *"The U.S. Chemical Weapons Destruction Program: Views, Analysis, and Recommendations"* (October 1994) provides an overview of the controversies associated with the Army's stockpile incineration program, which is slated to operate in eight different U.S. sites where the weapons are stored. The report also turns a critical eye to the charges made by opponents to the Army's program, finding the science behind some of these allegations to be poor and lacking in discipline. Consequently, the report recommends that the Army's program be assessed on its own merits, not on the negative stereotype of incineration, and that opposition charges be viewed skeptically. Other recommendations are aimed at facilitating citizen participation in the decision making process and improving oversight of the Army's program.

The Carnegie Corporation of New York funds this project, which is directed by Amy E. Smithson.

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Dr. Vil S. Mirzayanov was a scientist for 26 years at the State Research Institute of Organic Chemistry and Technology in Moscow, rising to become the head of the Department of Counteraction to Foreign and Technical Investigations. Dr. Mirzayanov has published over 160 research publications and articles. In addition, he has authored or co-authored 15 patents. Dr. Mirzayanov is a graduate of the Lomonosov Institute of Fine Chemical Technology (Moscow), the Research Institute of Petrochemical Synthesis of the Russian Academy of Sciences (Moscow), and the State Research Institute of Organic Chemistry and Technology.

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News Advisory

Senate Permanent Subcommittee
on Investigations
EXHIBIT # 1b.

Senate Inaction on Chemical Treaty

America's Safety, Security, and Leadership at Stake

- **Embargoed until
9:30 a.m.
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Washington—Continued Senate delay on the ratification of the Chemical Weapons Convention (CWC) may jeopardize America's own safety and security as well as international efforts to ban deadly chemical weapons, according to a new report by the Henry L. Stimson Center. The CWC is designed to ban a category of weapons that are universally abhorred. A decade ago, Congress mandated that the Army unilaterally destroy well over ninety-five percent of the U.S. chemical weapons stockpile.

In this report, entitled *The U.S. Senate and the Chemical Weapons Convention: The Price of Inaction*, leading political and security experts warn that damage may result if the Senate continues to shirk its constitutional duties. Senate ratification is considered critical to launch the CWC, which aims to curtail chemical weapons proliferation and to compel the elimination of chemical arsenals worldwide.

In the report, Senator John Glenn, a veteran of two wars, argues that "Americans should walk the extra mile to ensure that future generations will not have to endure the kinds of warfare that the last two generations had to endure." Glenn notes that the CWC has overwhelming bipartisan support in the Senate, and that delaying the CWC due to lack of progress on other legislative agendas "is a very risky business when treaties are at stake that affect vital national security interests."

The CWC has been awaiting a Senate vote since November 1993. Numerous hearings on the CWC were held last year, but none have been convened in 1995. Most recently, the treaty has been held hostage by Senate Foreign Relations Committee Chairman Jesse Helms' (R-NC) demand that the State Department be reorganized and streamlined.

Calling for U.S. leadership on this agenda, former Secretary of State Lawrence Eagleburger describes the CWC as "an important part of an international structure that would increase U.S. and global security in the next century." Another senior member of the Bush administration, former National Security Adviser Brent Scowcroft, states "The time has come for the Senate to uphold U.S. leadership in combatting the proliferation of weapons of mass destruction by providing its advice and consent to the Convention." Joining the call for ratification of the CWC are Senators Nancy L. Kassebaum, John F. Kerry, and Joseph R. Biden; the Bush administration's director of the Arms Control and Disarmament Agency, Ronald F. Lehman; and the U.S. Chemical Manufacturers Association, among others.

> ***"The time has come for the Senate to uphold U.S. leadership in combatting the proliferation of weapons of mass destruction by providing its advice and consent to the Convention." Brent Scowcroft***

"The un-making of the CWC could have consequences well beyond the chemical arms control arena."

Without the CWC, the United States will not have essential investigative, legal, and economic instruments with which to restrain the proliferation of chemical weapons. The CWC's intrusive verification measures, especially its challenge inspections, go much farther than those in any other arms control treaty. In the view of Michael Moodie, president of the Chemical and Biological Arms Control Institute, not availing ourselves of these useful tools "would be short-sighted, indeed foolish, and ultimately, dangerous."

The Senate's failure to provide its consent to ratify the CWC could lead to the further unravelling of U.S. nonproliferation policy. Without the United States on board, many countries may back away from the CWC and reconsider their decisions to forego chemical weapons. In this report, Sheila R. Buckley, a Pentagon official during the Reagan and Bush administrations, highlights how "the un-making of the CWC could have consequences well beyond the chemical arms control arena." For instance, current efforts to strengthen the Biological and Toxin Weapons Convention are also likely to falter.

The Senate's vacillation on the CWC could leave the treaty and its new international monitoring agency on hold indefinitely, to the detriment of both. Or, as the Stimson Center's Amy E. Smithson points out, the CWC could enter into force without the United States, in which case Washington would lose its vote in how inspections are conducted, be shut out of key positions at this inspectorate, and be denied formal access to the information that the agency's inspectors collect. Either way, "the United States ends up on the sidelines, poorly positioned to address the problem of chemical weapons proliferation," she states.

Not availing ourselves of the CWC's intrusive inspections "Would be short-sighted, indeed foolish, and ultimately, dangerous."

Recent events in Japan underscore new dimensions of the threat from chemical weapons. Last March, terrorists used the nerve agent sarin in an attack that killed 12 and injured some 5,000 Tokyo subway commuters. The problem, notes H. Martin Lancaster, the president's special adviser on the CWC, is that chemical weapons "are relatively cheap to produce and do not demand the elaborate technical infrastructure needed to make nuclear weapons. It is therefore all the more vital to establish an international bulwark against the acquisition" of these weapons. The CWC and its implementing legislation would enhance the ability of domestic and international law enforcement agencies to detect activities associated with chemical terrorism and prosecute those involved.

Is the Senate going to replicate its past performance in considering chemical weapons treaties? Half a century passed before the Senate ratified the Geneva Protocol, which bans the use of chemical weapons. Two years have already passed without a Senate vote on the CWC. Meanwhile, the chemical weapons threat has continued to fester.

This report is a product of the Chemical Weapons Convention Implementation project, which is funded by the Carnegie Corporation of New York. Smithson, a senior associate at the Stimson Center, directs this project. The Henry L. Stimson Center is a nonprofit, nonpartisan research institution devoted to public policy research. The Stimson Center concentrates on particularly difficult national and international security issues where policy, technology, and politics intersect.

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Views About the Chemical Weapons Convention

Lawrence S. Eagleburger:

The Chemical Weapons Convention is an important part of an international structure that would increase U.S. and global security in the next century. If we do not lead this effort to curb the proliferation of chemical weapons and initiate their global elimination, we increase the chances that we will encounter disasters in the 21st century reminiscent of those that occurred in the first fifty years of the 20th century.
Lawrence S. Eagleburger, Secretary of State during the Bush administration, statement given to the Henry L. Stimson Center, 17 October 1995

General Brent Scowcroft:

Success in rolling back the threat of chemical weapons proliferation requires well-equipped U.S. military forces and chemical defense preparedness. However, the clear international norms against chemical weapons, the legal framework, and the challenge inspections embodied in the Chemical Weapons Convention are also needed. The time has come for the Senate to uphold U.S. leadership in combatting the proliferation of weapons of mass destruction by providing its advice and consent to the Convention.
General Brent Scowcroft (USA, ret.), National Security Adviser during the Bush administration, statement given to the Henry L. Stimson Center, 16 October 1995

Senator Joseph R. Biden:

The single greatest threat facing the United States today is the proliferation of weapons of mass destruction. We need to use every means at our disposal to reduce the chances of a chemical attack in our country. The Chemical Weapons Convention is an irreplaceable tool to achieve that goal.

Further delay by the U.S. Senate in considering the CWC would be a dereliction of our duty to serve those we represent. It would bring comfort only to those rogue states and terrorists who are trying feverishly to acquire chemical weapons.
Senator Joseph R. Biden, statement given to the Henry L. Stimson Center, 30 October 1995.

Senator Nancy L. Kassebaum:

The Chemical Weapons Convention will not prevent all future chemical attacks, particularly by terrorists. Bit it nevertheless is an important and constructive international mechanism to check and reverse the proliferation of chemical weapons. In particular, it will be crucial to help ensure that the enormous chemical stockpiles of the former Soviet Union are destroyed before they fall into dangerous hands. The United States cannot stop the proliferation of these weapons alone, and that is why our participation with other nations in ratifying and implementing the

believe our leadership is important for the uncertain times that lie ahead.
Senator Nancy L. Kassebaum, statement given to the Henry L. Stimson Center, 25 October 1995

Senator John F. Kerry:
Chemical weapons are potentially one of the most serious threats to America's armed forces on future battlefields, and their proliferation is a cause for great anxiety. Recent events in Tokyo highlight the possibility of chemical terrorism around the world, which could easily manifest itself in the United States. Our nation's highest military and intelligence officials repeatedly have stated that while the Chemical Weapons Convention is no panacea for these threats, our nation will be safer and we will have greater ability to reduce chemical weapons proliferation, and to identify and remove chemical weapons threats, if the United States and a majority of the world's nations ratify this treaty. The United States should be leading this effort, and it is both absurd and inimical to our self-interest that the Senate has yet to consider and vote on the CWC. I urge my colleagues in the Senate -- and all concerned Americans -- to join me in insisting that Chairman Helms of the Foreign Relations Committee quickly permit the Committee to act on it, and that soon thereafter Senate Majority Leader Dole schedule Senate floor action.
Senator John F. Kerry, statement given to the Henry L. Stimson Center, 23 October 1995

Frederick L. Webber:
The U.S. chemical industry worked hard to help government negotiators craft a CWC that provides strong protections against future uses of chemical weapons, at a minimum burden and intrusion on commercial chemical facilities. With the negotiations on the Convention complete, it is critical that the United States provide leadership in implementing this global agreement. The protections our industry achieved in the CWC can only be realized if the Senate acts quickly to ratify the Convention.
Frederick L. Webber, president of the Chemical Manufacturers Association, statement given to the Henry L. Stimson Center, 30 October 1995

Ronald F. Lehman, II:
With the CWC in force, we can more effectively reduce the dangers faced by our troops when they are deployed within range of the weapons of outlaw regimes. With the CWC ratified, we can more easily marshal the international and domestic support necessary for the strong countermeasures we must take when we are threatened by weapons of mass destruction. Indeed, our efforts to counter the proliferation of nuclear and biological arms may falter if we cannot even codify the ban on chemical weapons that, under the personal leadership of two Republican presidents, the United States sought and achieved.
Ronald F. Lehman, II, director of the Arms Control and Disarmament Agency during the Bush administration, statement given to the Henry L. Stimson Center, 25 October 1995

General John M. Shalikashvili:

From a military perspective, the Chemical Weapons Convention is clearly in our national interest. The Convention's advantages outweigh its shortcomings. The United States and all other CW-capable state parties incur the same obligation to destroy their chemical weapons stockpiles...if we do not join and [we] walk away from the CWC an awful lot of people will probably walk away from it as well, and our influence on the rogue states will only decrease.
General John M. Shalikashvili, Chairman of the Joint Chiefs of Staff, testimony before the Senate Foreign Relations Committee, 23 June 1994

James Woolsey:

In sum, what the Chemical Weapons Convention provides the intelligence community is a new tool to add to our collection tool kit. It is an instrument with broad applicability, which can help resolve a wide variety of problems. Moreover, it is a universal tool which can be used by diplomats and politicians, as well as intelligence specialists, to further a common goal: elimination of the threat of chemical weapons.
James Woolsey, former Director of Central Intelligence, testimony before the Senate Foreign Relations Committee, 23 June 1994

Ambassador Stephen Ledogar:

Now the United States still has both the responsibility and the ability to bring this endeavor to full maturity. The CWC's entry into force and implementation at the earliest possible date lies in our hands as the international community is looking to us to lead the way toward ratification.
Ambassador Stephen Ledogar, Chief U.S. Negotiator for the Chemical Weapons Convention, testimony before the Senate Foreign Relations Committee, 13 April 1994

Cord Meyer:

The Chemical Weapons Convention...[is] being held hostage to Mr. Helms' demand that ACDA be integrated into the State Department. ...the delay in acting on the Chemical Weapons Convention increases the danger of proliferation. ...Arms control is too important to be left half done.
Cord Meyer, contributing writer to The Washington Times, from "Unfinished arms control business," 13 October 1995

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The U.S. Senate and the Chemical Weapons Convention: The Price of Inaction

Senator John Glenn
H. Martin Lancaster
Michael Moodie
Sheila R. Buckley
Amy E. Smithson
Michael Krepon

Report No. 18 October 1995

Pragmatic steps toward ideal objectives

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Introduction

Michael Krepon

The passage of time is the enemy of U.S. treaty ratification. As the Chemical Weapons Convention (CWC) now approaches the third anniversary of its signing ceremony without Senate action, the specter of the 1925 Geneva Protocol has begun to haunt the Senate chamber. The Geneva Protocol effectively barred only the first use of chemical weapons. A highly popular treaty prompted by the horrors of chemical weapons use during World War I, it nonetheless was not acted upon by the Senate for fifty long years.

The CWC goes well beyond the Geneva Protocol, banning the development, production, acquisition, stockpiling, and transfer of chemical weapons, as well as use. It is a highly valued treaty at home and abroad. Many of its provisions, including its intrusive inspection procedures, bear the stamp of the United States. The need for the CWC's controls and inspections has become more evident with the passage of time, as chemicals have been used on third world battlefields and modern subway systems.

When will the Senate act? Will the CWC suffer the same fate as the Geneva Protocol? As the essays that follow make abundantly clear, much will be lost if the Senate continues to shirk its constitutional responsibilities. A Senate debate is urgently needed to discuss the pros and cons of the CWC. The American public and the international community deserve a vote on this treaty.

The essays that follow conclude that the CWC deserves to be ratified by the United States, and that much harm can come from the U.S. Senate's failure to consent to ratification.

In the opening essay, Senator John Glenn expresses his conviction that the CWC is a treaty benefiting not only the United States, but also the international arms control effort. He notes that the treaty has overwhelming bipartisan support in the Senate and that issues of concern have been aired fully in hearings. "As a veteran of two of this country's most violent wars," Glenn states, "I believe that all Americans should walk the extra mile to ensure that future generations will not have to endure the kinds of warfare that the last two generations had to endure." Delaying the CWC's consideration because of lack of progress on other legislative agendas is "a very risky business when treaties are at stake that affect vital national security interests," he concludes.

Michael Moodie's essay discusses the CWC's verification provisions and the threats that are likely to fester if the CWC is not implemented. Moodie points out that "the CWC provides such useful tools in addressing suspicions or allegations of developing or using chemical weapons that not availing ourselves of them would be short-sighted, indeed foolish, and ultimately, dangerous." Russia, for example, "can be held accountable under legally binding obligations, including the complete destruction of its chemical stockpile and the acceptance of challenge inspections" under the CWC.

Sheila R. Buckley addresses the international consequences of continued Senate inaction. She believes that Russia, and perhaps China, would emulate the United States. Still other countries would begin to re-evaluate their security calculations regarding the CWC and whether they should possibly pursue chemical weapons in the absence of a strong international regime to contain them. She concludes that "the un-making of the CWC could have consequences well beyond the chemical arms control arena," noting that efforts to strengthen the Biological and Toxin Weapons Convention are also likely to falter.

Amy E. Smithson's essay details the likely consequences of the Senate's inaction on the CWC's nascent implementing organization, the Technical Secretariat. She describes two scenarios likely to unfold if the Senate's consent to ratification is not soon forthcoming. In the first scenario, the CWC never enters into force because the U.S. and Russian legislatures remain dormant. In the second scenario, the CWC is activated without the United States. "Either way," she notes, "the United States ends up on the sidelines, poorly positioned to address the problem of chemical weapons proliferation." In the process, the Technical Secretariat could be permanently crippled.

H. Martin Lancaster, President Clinton's Special Adviser on the CWC, observes that the threat from chemical weapons is quite severe because "they are relatively cheap to produce and do not demand the elaborate technical infrastructure needed to make nuclear weapons. It is therefore all the more vital to establish an international bulwark against the acquisition as well as the use of these weapons."

The Stimson Center wishes to thank the authors for their contributions. We are grateful to Dr. Randy Rydell of Senator Glenn's staff and Ms. Amy Gordon of the Arms Control and Disarmament Agency for the assistance they provided. Senior Associate Amy E. Smithson, Director of the Stimson Center's CWC Implementation Project, worked closely with the authors. Her research assistant, Laurie Boulden, also provided crucial help in pulling together this report, which was proofed by Brian Curran, Sony Devabhaktuni, Jill Junnola, Howard Kee, Kathleen Walsh, and Christine Wormuth. Credit for this report's polished appearance goes to Laurie Boulden and Jane Dorsey.

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Why the Senate Should Ratify the Chemical Weapons Convention

Senator John Glenn

The actions of the United States Senate will have a lot to do in determining whether 1995 will prove to be a glorious year for arms control and nonproliferation, or a missed opportunity. Though the few months remaining in this legislative session will present enticing opportunities for partisan bickering on all sorts of issues, I remain hopeful that Congress can still make progress in these particular areas. Coming in the wake of the recent permanent extension of the Treaty on the Non-Proliferation of Nuclear Weapons, prompt Senate ratification of the Chemical Weapons Convention (CWC) would provide a much-needed boost to international arms control and disarmament efforts. We stand today on the verge of eliminating one of the deadliest weapons from the face of the Earth.

As a veteran of two of this country's most violent wars, I believe that all Americans should walk the extra mile to ensure that future generations will not have to endure the kinds of warfare that the last two generations had to endure. Although war or the threat of war will likely remain permanent risks in the world of nation states, there are some signs of hope that certain forms of warfare might someday be brought under control or abolished outright.

The Twentieth Century has witnessed the development and use of all forms of what we now call "weapons of mass destruction." A hallmark of World War I and the Iran-Iraq War of the 1980s was the use of chemical weapons. World War II involved the use of both biological and nuclear weapons. Since that war, novel techniques have been devised to make such weapons lighter, more lethal, and capable of reliable and accurate delivery over long distances. These are weapons that cannot distinguish between civilian and military targets. These are weapons that are deadly enough in the hands of leaders of nation states and that give rise to new nightmares in the hands of subnational groups, as best illustrated by the poison gas attacks this year in downtown Tokyo.

Such risks have motivated efforts of the United States and other countries to seek a ban on both biological and chemical weapons and to pursue new efforts to limit the vertical and horizontal proliferation of nuclear weapons. To achieve such objectives requires an extraordinary amount of international cooperation. It requires binding obligations. It requires an effective means of verification. It requires a system of sanctions to impose costs on those who violate their obligations. It requires new institutions to coordinate the implementation of new international norms. It requires significant adjustments of national policies. And given that multilateralism has to begin somewhere, it requires significant U.S. leadership.

America's support for a treaty outlawing chemical weapons is perhaps as strong now as it has ever been. This support is bipartisan. It was a Republican President who signed the Chemical Weapons Convention and it is a Democratic President who is now seeking to get it ratified this year. The treaty has strong support from the chemical industry. The Joint Chiefs of Staff support the treaty. The American people support the treaty.

Indeed, hardly anybody these days sincerely argues for the United States to retain an arsenal of chemical weapons, for plenty of good reasons:

- As the events in Tokyo demonstrate, chemical weapons are more likely than nuclear weapons to be used in war or in terrorist attacks, although they clearly are not as potentially lethal as either biological or nuclear weapons.
- They are readily concealable, lightweight, and transportable.
- Many of these weapons can be fabricated with readily-available materials and equipment.
- They are cheap to produce.
- They require comparatively little technical expertise to develop or produce.
- They can be manufactured in small facilities that are extremely difficult to detect.
- There exists no perfect defense against all chemical weapon threats, especially against attacks without warning against civilian populations.
- History has shown time and again that the possession of chemical weapons offers little value as a deterrent—from Ypres to Halabja, all too often the side possessing such weapons has become the victim of chemical attacks.

Therefore, a virtual consensus on the nature of the threat exists, as does a diverse base of support for the CWC. Nonetheless, the Senate has still not acted to ratify the CWC. And in the face of Senate inaction, 40 countries have ratified the treaty. Many of the more than 155 signatories of this treaty are delaying their ratification decisions until the United States Senate ratifies the treaty.

Several factors account for the failure of the Senate to act, including the effects of some active lobbying by a handful of vocal individuals and groups that are opposed to the treaty. Some critics outside the government—citing many of the characteristics of chemical weapons described above—argue that the CWC is simply not verifiable. Others fear the high costs of implementing verification arrangements. Some complain that the verification system will jeopardize the confidentiality of commercial proprietary data. Others cite various legal and constitutional problems. Finally, some appear to believe that chemical weapon nonproliferation policies should simply be targeted at four or five so-called "rogue nations" rather than framed as a global problem.

Each of these arguments has been extensively debated in Congress, both at the committee level and on the floor of each house. Each of these arguments has to my satisfaction been successfully rebutted.

Yes, the treaty does raise tough problems of verification—but are we better off with an international system of managed-access inspections, or with no inspections at all? Many of these problems, moreover, can be addressed by prudent investments in maintaining America's intelligence capabilities (in both collection and analysis) and ensuring the readiness of our military to address such threats should they arise.

Yes, the treaty will cost some money to implement—but surely such costs must pale in comparison to the costs that we and other nations would have to pay to survive in a world where chemical weapons remain legitimate instruments of warfare.

Yes, the treaty may open up some new risks to proprietary data, yet if this risk is as great as the critics claim, why does the industry that has the most at stake remain in full support of the treaty?

Yes, the treaty will require some additional domestic legislation, but existing procedural and legal guarantees are adequate to protect constitutional rights.

Evidence indicates that more countries are seeking to obtain or retain a chemical weapons capability than to acquire nuclear or biological weapons. Therefore, a truly effective approach to prevent them from succeeding must be global in scope—and the less discriminatory the regime, the broader will be its base of legitimacy in the world community.

Even if the case for the treaty is strong on substance, however, there are other factors at work to slow its ratification. Over the history of the Senate, one delaying tactic has been to link progress in ratifying a treaty with other legislative agendas. Though this so-called "log-rolling" approach is fairly common in domestic legislation, it is a very risky business when treaties are at stake that affect vital national security interests. Ultimately, the practitioners of such approaches will have to answer to the voters for their actions.

The basic question comes down to: "Are we better off with the treaty or without it?" The overwhelming majority of members of Congress would agree that we are better off with this treaty. It serves our national interest. The American people support it. These are, in sum, the reasons why I believe that the Senate should ratify the CWC.

Verification, Compliance, and the CWC

Michael Moodie

The success of any arms control agreement is based on confidence that parties to that agreement are in compliance with their obligations, that those who are not in compliance run a reasonably high risk of being caught, and that, if they are caught, the international community will do something about it. Concluding an agreement is only the first step in the arms control process. Success is not inherent in an agreement's specific provisions, however well crafted and elegant they may be. No arms are controlled, no proliferation stemmed, until agreements are properly implemented.

The core of implementing an arms control agreement is its verification procedures. A treaty must be verifiable insofar as a significant violation, should it occur, will be detected in time to provide an adequate response. Ideally, the verification mechanisms of a multilateral arms control agreement will deter violations by convincing potential cheaters that they will be caught and that the costs of cheating are higher than the costs of compliance. The basic purposes of verification, then, are deterrence, detection, and building confidence in compliance.

Arms control agreements do not stand in isolation, either in time or in substance. The international community has drawn lessons—both positive and negative—from other arms control agreements and has applied these lessons to subsequent agreements. Each new agreement contributes to a global arms control architecture in which the components of the system (i.e., the specific agreements) are intended to be mutually reinforcing.

Thus, non-ratification of the Chemical Weapons Convention (CWC) by the U.S. Senate will have serious consequences—mostly negative—for the verification and compliance dimensions of the arms control agenda. Non-ratification will make it more difficult to control chemical weapons specifically. Moreover, failure of the Senate to act will set back the broader efforts of the international community to respond to the challenges posed by other instruments of violence—including other weapons of mass destruction—and constrain the global actors who would use them.

The 159 states that have signed the CWC as of October 1995 reflect a broad international consensus that not only should the first use of chemical weapons be prohibited, but also their development, production, storage, and transfer. The CWC represents a stricter norm regarding the behavior of states than the 1925 Geneva Protocol's ban on the use of chemical weapons. Unless such a standard is embodied in an international legal instrument, however, efforts to deal with chemical weapons programs of other countries will founder. No grounds will exist, for example, to raise objections to activities—such as production and storage of chemical weapons—that fall short of chemical weapons use but which, nevertheless, represent a significant threat to other nations and to regional, and possibly global, stability.

The CWC provides both the standards of behavior by which states should be judged and the tools to determine whether a particular state is meeting those standards. Non-ratification of the CWC by the Senate would leave the United States without either.

The CWC will not, on its own, ensure the complete elimination of chemical weapons. Nor is its verification system airtight and certain to discover irrefutable proof of noncompliance in all cases where it occurs. The CWC's verification provisions, however, represent a major step forward in that critical function of the arms control process. The CWC provides such useful tools in addressing suspicions or allegations of developing or using chemical weapons that not availing ourselves of them would be short-sighted, indeed foolish, and ultimately, dangerous.

Addressing Concerns About Chemical Weapons Activities in Russia

Senate inaction on the CWC has notable consequences for verification and compliance concerns about a chemical weapons program of Soviet origin. Throughout the Cold War, the United States entertained scenarios involving chemical weapons use in a Warsaw Pact attack—a contingency deeply disturbing to the military and political leaders of the North Atlantic Treaty Organization. Moscow ultimately joined Washington as one of two capitals to declare publicly that it held a chemical weapons stockpile of about 40,000 tons, an amount that exceeds U.S. holdings by 10,000 tons. The United States, however, had relatively little information about the Soviet stockpile. U.S. concerns were elevated in 1991 when scientists from within the Soviet chemical weapons complex made allegations about the development of new chemical agents, despite Moscow's 1987 assertion that it had ceased chemical weapons production. Despite the importance of U.S. questions about the "novichok" chemical weapons program, the United States had no firm mechanism for generating answers.

Nonetheless, the United States began pushing for answers through previously established bilateral channels. The 1989 Wyoming Memorandum of Understanding provided for a *voluntary* exchange of data between the United States and the then Soviet Union about the chemical weapons stockpiles of each side. The agreement also called for a series of reciprocal practice inspections. Data exchanges were made in 1989 and 1994. Both times, Washington registered several concerns with Moscow regarding what it felt were incomplete or anomalous data. Moscow did the same. More exchanges were held to clarify the data and resolve anomalies, but both sides continue to seek additional information to clarify questions and concerns.

A second agreement—the Bilateral Destruction Agreement—was concluded in June 1990. This agreement called for each side to destroy its chemical stocks, at least to a level of 5,000 tons. Inspectors from the other side would monitor the destruction process. Like the Wyoming memorandum, the Bilateral Destruction Agreement was designed to facilitate the multilateral CWC negotiations in Geneva by providing a general approach to assist in overcoming the verification and destruction hurdles bedeviling the negotiators. The provisions of the bilateral agreement represented a complementary effort that helped to break some logjams in the CWC talks.

After five years, however, implementation of the Bilateral Destruction Agreement has not occurred and there are few signs that it will soon be activated. The reasons for lack of progress are many, including a shortage of Russian financial resources to initiate a chemical weapons destruction program. Another serious obstacle has been an ongoing dispute between the two sides over how to handle former chemical weapons production facilities. The CWC requires the destruction of these facilities, especially the specialized equipment within them that could be used to manufacture chemical weapons. Russia has converted some of its former chemical weapons production facilities into commercial enterprises, and it has no desire to lose the investment this conversion represents. Washington and other states worry that these facilities, at least theoretically, could be reconverted for military purposes, and they insist that Russia agree to provisions that would make reconversion at those sites impossible. No way has been found out of this impasse.

Clearly, these bilateral agreements have not resolved all the concerns about the Russian chemical weapons program. Unlike the bilateral agreements, once Russia ratifies the CWC, Moscow can be held accountable under legally binding obligations, including the complete destruction of its chemical stockpile and the acceptance of challenge inspections. If states felt that Russia provided inaccurate or misleading information in its declarations on a wide variety of chemical-related activities, challenge inspections could be requested and promptly executed.

The United States is not the only country that would welcome a chance to clarify concerns about chemical activities in Russia. The United States need not stand alone in pressuring Moscow to comply fully with its obligations. As H. Martin Lancaster, the President's Special Adviser for the CWC, has pointed out, "The CWC will place Russian activities under intense international scrutiny and empower the world community to respond to any concerns about noncompliance with intrusive verification measures, political pressures, and possible sanctions."

Unless Russia becomes a party to the CWC, this discussion is moot. At least some members of the Russian leadership do not appear interested in ratifying the CWC. Elements of the Russian military are reportedly unconvinced that eliminating the chemical stockpile is in their nation's strategic interest, although it is not clear that this is a majority, or even significant minority, view. Some members of the Russian Duma have endorsed the CWC and the destruction of the Russian stockpile, but have been reluctant to act because the costs of mounting a destruction program are prohibitive for a financially strapped nation. Some Duma members argue that they should not ratify the CWC until further monetary assistance is assured.

Nonetheless, Senate delay in ratifying the CWC imposes costs with respect to Russia. Postponement of U.S. ratification undermines the reformers in Russia who support the treaty and gives a free ride to the hardliners who wish to continue a chemical weapons program. With no U.S. example, those hardliners will feel no pressure and be free to postpone action indefinitely. Such an Alphonse-Gaston political act would doom the CWC's entry into force to a state of perpetual suspension.

Russian leaders are cognizant of the practical consequences of not being part of the CWC when it begins to operate. Russia will loose its role in the new international monitoring agency and its vote in establishing the CWC's operational regulations for data declarations, inspections, and administration. In short, if Russia doesn't ratify, Russia doesn't play. If Russia remains outside the regime for too long, the CWC mandates that its trade in chemicals governed by the CWC be cut off or restricted. As for the political costs of not coming aboard, Russia would be forced into a splendid isolation from a global consensus, which is not a position the current Russian leadership finds comfortable. Moscow would feel the reproach of the international community by its reluctance to join a global norm.

U.S. ratification and the subsequent entry into force of the CWC generate probably the greatest political pressure on Moscow to join the agreement. Congress also has other levers that it can apply. For example, the Nunn-Lugar Cooperative Threat Reduction program has provided

U.S. financial assistance to Russia and other states to help secure and expedite the dismantlement of former Soviet nuclear weapons. Providing assistance for Russia's chemical weapons program is a significant carrot to help Moscow make wise choices about eliminating its chemical stockpile. In contrast, cutting Nunn-Lugar assistance for Russia's chemical weapons destruction program reduces America's leverage to ensure that Moscow provides a full accounting of its chemical weapons program and begins to get rid of its stockpile.

Beyond Russia

Obviously, Russia is the not the only country of concern as a potential chemical weapons possessor or proliferator. The U.S. government notes that more than two dozen countries are suspected of having chemical weapons or the capability to produce them. Among the states usually listed as suspected proliferators are North Korea, Syria, Libya, and Iran. Israel, Vietnam, Myanmar, and Taiwan are also identified by some analysts.

China's chemical weapons capabilities merit special concern. A Chinese offensive chemical weapons program has been widely alleged, although Chinese officials consistently reject those charges and unclassified confirmation of a Chinese chemical arsenal remains unavailable. China has a significant chemical and pharmaceutical industry, so it would not be beyond the realm of possibility that China has clandestinely produced or stockpiled chemical weapons. Moreover, the Arms Control and Disarmament Agency's 1995 noncompliance report found that "China maintained an offensive [biological weapons] program throughout most of the 1980s....and there are strong indications that China probably maintains its offensive program." If the pattern of past proliferators holds—that weapons of mass destruction programs are pursued not sequentially but simultaneously—then China could well be involved in a chemical weapons program. In light of expectations that China will continue to emerge as a regional power in Asia and perhaps beyond, the prospect of Beijing maintaining such an arsenal is distinctly unwelcome.

If lack of U.S. leadership translates into the CWC's failure to enter into force or its debilitated entry into force, the United States will have no instruments beyond national intelligence means for exploring these concerns. National intelligence efforts have been only moderately successful in detecting incidents of chemical weapons proliferation, and the intelligence community is being asked to assume a greater responsibility in the nonproliferation arena at a time when its resources are being cut. On some occasions, the reluctance to use sensitive intelligence information has hampered the U.S. government's ability to make a convincing public case that proliferation has occurred, making it difficult to rally the necessary domestic and international support to act decisively in response.

Even the CWC's most ardent supporters recognize that the treaty's verification provisions are not certain to uncover the "smoking gun" that provides incontrovertible evidence of noncompliance. Verification, however, is not some mechanistic, cut-and-dried process that produces unambiguous evidence. Judgments on noncompliance are formed from a mosaic of evidence created over time using multiple-source information, including treaty-embedded practices and other national resources. The essence of verification is generating data and making judgments about that information. The CWC's verification regime provides critical opportunities for forming such a mosaic and noting quickly when particular pieces do not seem to fit, prompting yet further scrutiny.

The CWC creates unprecedented monitoring opportunities through the range of verification measures it incorporates and the scope of activities it addresses. Development of a militarily significant chemical weapons program entails many stages—research, development, production, agent storage (either in bulk or weaponized), munitions filling, incorporation into military doctrine, training, and so on. Some of these activities are more detectable than others. By banning all of them—except limited research for defensive purposes, which will be closely monitored—the CWC can be used to identify a variety of irregularities in a state's behavior. If one piece of the mosaic does not seem to fit, then other pieces can be examined more closely for an explanation of the anomaly.

The treaty's ability to sustain attention on a country of concern is one of its unappreciated assets. The key lesson of the experience of the United Nations Special Commission in Iraq was that its greatest successes did not result from discovering smoking guns. Rather, the Special Commission's successes were based on painstaking efforts over time to analyze a wide range of information, evaluate patterns that emerged from that analysis, identify gaps in those patterns, and push continually for additional information to fill those gaps. The workings of the CWC are not dissimilar; it provides the mechanisms to build those same kinds of patterns, discover anomalies, and exert constant pressure to obtain missing information.

In his 1994 testimony in support of the CWC's ratification, then CIA Director James Woolsey admitted that the intelligence community did not have high confidence that it could detect small-scale noncompliance with the CWC. He went on to say, in comments often overlooked by the treaty's critics, that the CWC would nevertheless deter some potential proliferators and strengthen the intelligence community's ability to assess proliferation problems. With or without the CWC, the intelligence community is charged with ascertaining which states are developing and producing chemical weapons.

Woolsey's comments underline the difficulty of detecting smaller chemical weapons programs of the kind that might be pursued by terrorists or other non-state actors. The CWC was not primarily designed for this task. Indeed, terrorism with weapons of mass destruction is a complex challenge for which no single policy instrument is the silver bullet. Responding successfully to the challenge of terrorism, even when it involves weapons of mass destruction, remains first and foremost a function of good law enforcement and intelligence.

Given the dual-use nature of many chemicals and the relative accessibility of the science involved in making chemical weapons to a reasonably trained organic chemist, it is impossible to guarantee a nation's invulnerability to the terrorist use of chemical weapons. The CWC, however, requires states to pass domestic legislation criminalizing the involvement of any citizen or enterprise in the abetment or pursuit of chemical weapons. This legislation also enables improved tracking of chemicals that could be used to make chemical weapons and could serve as the springboard for tougher measures to monitor domestic activities with dual-use chemicals. Together with other key policy instruments available in the fight against terrorism, the CWC can contribute to the web of deterrence against the terrorist use of chemical weapons and raise the costs of such activities.

The Consequences of Inaction

The CWC has been hailed justifiably as a landmark arms control and nonproliferation agreement in part because of its extensive verification provisions. Those provisions are unmatched in their scope, theoretically making any location in every state party susceptible to a challenge inspection. For the first time in history, the CWC's provisions extend arms control obligations deeply into the commercial sector. They also specify a number of innovative verification procedures—such as the concept of "managed access" in the conduct of an inspection—that represent important precedents for future agreements.

If the CWC does not enter into force, the benefits of these groundbreaking developments are likely to be lost, not only for meeting the chemical weapons challenge, but more broadly. Without practical experience in implementation, the international community is unlikely to incorporate verification provisions that were contentious in the CWC in other arms control and nonproliferation efforts.

The example set by the CWC's approach to verification is evident in current efforts to bolster confidence in compliance with the Biological and Toxin Weapons Convention (BWC). An Ad Hoc Group of states parties to the BWC has been given a mandate to negotiate a legally binding protocol that includes measures to allow states parties to probe further into questions of compliance. In this exercise, states are focusing on an approach that closely resembles the one defined in the CWC, particularly its basic framework of declarations and on-site activities to validate the information. Negotiators have drawn directly from their experience in creating the CWC's verification regime.

If the CWC does not enter into force in the near future, these efforts to strengthen the BWC are not likely to be successful, at least not in terms of including this declaration/inspection framework as the basis for bolstering confidence in compliance with the BWC. Without the operational experience that the CWC would provide, doubts of the BWC's members that the framework is a viable one will only increase, particularly since the issue of whether the BWC is verifiable continues to be hotly disputed. As a result, something less satisfactory is certain to emerge from the BWC negotiating process.

No sensible person would argue that the CWC ends the chemical weapons threat. The CWC is a tool, not an objective. It establishes a global norm against chemical weapons proliferation by which the behavior of states can be judged; it provides tools to examine troubling behavior; and it establishes a legal regime that can be used as a lever to mobilize the international community in the face of state behavior deemed unacceptable. As a product of hard-fought negotiations, the CWC is not perfect, nor are its verification provisions foolproof.

However, if the CWC continues to languish in the Senate, the United States will have lost a great opportunity to ensure that the verification and compliance functions of the arms control process are maintained in a manner capable of dealing with the challenges to global security and stability at the turn of the century. More importantly, the United States will have shown that it has not come to grips with the dynamics of the post-Cold War world, and that it is not ready to shape that world. If the Senate does not act on the CWC, it will show that it does not yet understand.

The International Repercussions of Senate Inaction

Sheila R. Buckley

The Senate has an opportunity to enhance measurably U.S. security and to affirm the judgment of both U.S. political parties that chemical weapons should be outlawed and can be safely outlawed now. More than twenty years were required to produce a treaty that the negotiating governments concluded would best enable the international community to cope during the coming critical years with chemical weapons proliferation. Without the Chemical Weapons Convention (CWC), a retrospective on the next decade would almost certainly reveal chemical weapons use and proliferation, much of which could have been headed off by a robust CWC. Prompt Senate consent to ratification of the CWC cannot ensure that its purposes will be fulfilled, but anything less incurs high risk that they will not.

While the Senate appears broadly supportive of the CWC's objectives and provisions, it has not pressed forward with its consideration of the treaty. Profoundly negative implications for the near- and long-term viability of the CWC would ensue should the Senate not give its advice and consent to the CWC soon. The CWC stands as the only available instrument for putting in place new law and procedures to minimize the prospects for further proliferation and use of chemical weapons. A singularly important factor influencing the CWC's success or failure is U.S. participation in this effort.

The United States played a prominent role in creating the CWC. The 1984 draft text presented by Vice President George Bush contained unprecedented verification provisions, including intrusive challenge inspections, which became the focal point of the negotiations and the hallmark of the eventual treaty. Along the way, nations participating in and observing the negotiations came to recognize the immutability of the U.S. commitment to chemical weapons disarmament. This legacy has resulted in expectations of continued, vigorous U.S. leadership and commitment. The Senate's hesitation on the CWC, however, calls that legacy into question.

Any perception that America is in retreat from chemical weapons disarmament would begin to invalidate the widely shared political vision that led the CWC, and would risk triggering a general disintegration of the process that has brought the international community to this crossroads. The longer the hiatus between U.S. signature and ratification, the greater the prospect that such a perception will develop. In that event, nations might well develop corresponding doubts about the validity of their own security and political calculations in support of the CWC.

The international community, led by the United States, must continue down the road to chemical weapons disarmament and enhanced security, lest the entire effort splinter and the threat of chemical weapons proliferation go largely unattended. Additional delay in the Senate's ratification of the CWC, or outright failure to do so, would initiate an unraveling process that could eventually become impossible to reverse. It might one day be possible to identify a turning point at which the chemical weapons disarmament process became unsalvageable.

Some Near-Term Implications

The CWC exists because most nations believe chemical weapons proliferation is a serious threat and that the treaty provides tools to grapple effectively with that threat. Nations have rightly rejected the contention that the CWC will have only a marginal impact, or that they cannot risk accepting its prohibitions. Over 155 states have concluded that the CWC's monitoring provisions, particularly challenge inspections, offer a significantly greater prospect of successfully addressing the chemical weapons problem than would continuing to rely only on current means. They also agree that confidence that their neighbors are not harboring chemical arsenals or capabilities will only be enhanced as more nations join the treaty. Holdouts will suffer not only the CWC's automatic economic penalties, but also the political stigma attendant to rejecting the behavioral norm embodied by the CWC.

The most important impact of the CWC lies in its ability to restrain the proliferation of chemical weapons. With the treaty in force, governments will be able to project regional security relationships wherein the threat of chemical weapons use is reduced or practically eliminated, thus providing them the confidence to forgo such weapons themselves. Decisions about military requirements and resource investments are largely based on threat projections and are understood to involve the highest possible stakes. Absent the CWC, shifts in the security landscape are apt to draw reactions that could further unsettle regional security balances. The CWC will enable states to counter the threat of chemical weapons at much lower costs than would be involved in maintaining military capabilities to do the same job.

As the U.S. ratification decision is pushed further into the future, nations are increasingly likely to read Senate inaction as indicative of fundamental U.S. concerns about the CWC itself. Many would, of necessity, begin to review their own conclusions about relying upon the CWC to curb proliferation and initiate chemical weapons disarmament. Some of these governments would eventually be forced toward worst case assumptions about their neighbors' intentions, about the deterioration of their regional security environments, and about the apparent gap between U.S. rhetoric and U.S. resolve with respect to chemical weapons disarmament. Speculation may emerge about whether the United States has begun to question the adequacy of its own conventional capabilities to cope with the chemical weapons threat, giving pause to states that rely on U.S. willingness to help enforce the CWC, to resist chemical weapons use, or to help victims of a chemical attack.

In such real or imagined circumstances, many governments would draw back from the CWC, each believing it could not afford to be the last to do so. Some, particularly governments involved in intractable regional hostilities where adversaries' nuclear or biological capabilities could also be present, would also begin to review the utility of chemical weapons possession in their security calculations.

States that have quietly developed a chemical weapons capability and perhaps amassed chemical arsenals would welcome the relaxation of international political and economic pressures that would come with the emerging uncertainties about the viability of the CWC. These chemical weapons proliferators could anticipate avoiding indefinitely the outlaw or at least pariah status that entry into force of the CWC would confer. Moreover, their trade in dual-use chemicals would continue relatively unfettered, enabling them to enlarge or improve their chemical stockpiles. Such states might be emboldened to cross other, undesirable thresholds.

Finally and perversely with respect to proliferation, the fact that the effort to control chemical arms has reached its present stage increases the proliferation dangers associated with any unraveling scenario. The treaty-building process, particularly over the last five years, has required that knowledge about chemical weapons manufacture, storage, transport, delivery systems, protection, battlefield defense, and monitoring be shared with negotiators, their national experts, and prospective inspectors. Countries that may choose to revive or to initiate development of a chemical weapons capability may be in a better position to do so.

The CWC could, of course, limp into force without the United States, but the absence of U.S. expertise, political leadership, and financial support during the early months or years would be dramatically felt. The United States would be setting adrift the new monitoring agency in the Hague that will conduct the CWC's inspections. At some point in the future, the United States may join the CWC and turn to this very agency to conduct challenge inspections in a country the U.S. government believes has violated the CWC's obligations. The failure of the United States to participate from the outset may presage this agency's lackluster performance down the line.

Furthermore, participating states may perceive the Senate's delay as an indefinite rejection of the CWC, in which case governments that want to weaken the CWC's verification protocol would almost certainly launch an all-out attack on it as the Preparatory Commission settles the final operational decisions about declarations, inspections, and the monitoring agency's administration. If the CWC's verification protocol, which contains the strongest provisions ever negotiated in an arms control or disarmament treaty, is gutted by weak operational procedures, the international community's confidence in the nascent CWC will rightly be shaken.

There will be other near-term effects if the Senate's consent to ratification is not soon forthcoming. Other CWC signatories are alert to the reception that the U.S. chemical industry has given to the treaty. Even though other governments know that U.S. industry has contributed to the development of U.S. negotiating positions and hosted trial inspections to test inspection procedures, the perception persists that industry is not enthused about its vulnerability to certain costs and disruptions attendant to the CWC's implementation. In fact, as its long track record of support to the CWC negotiations and its testimony before Congress confirm, the U.S. chemical industry is willing to incur these costs. Nevertheless, foreign governments and the chemical industries to which they must respond could conclude that the Senate's inaction reflects some measure of U.S. industry rebellion against the overall manageability of the CWC's implementation.

The decisions of many governments and chemical companies to bear the burdens of the CWC are based in part upon the widespread participation of major commercial competitors. Should it appear that those competitors, particularly in the United States, might escape the CWC's burdens, foreign industry's willingness to support their government's participation in the CWC would erode. The U.S. chemical industry has invested a significant amount of time and energy in helping to design a treaty that can achieve the objectives of chemical weapons disarmament while protecting the interests of industry. These valuable contributions should be validated by the Senate's expeditious consent to ratification of the CWC.

Some Longer-Term Consequences

Understanding and addressing the dangers posed by the existence of nuclear, biological, and chemical weapons in the former Soviet Union is high on the U.S. national security agenda. Paralyzing domestic political dynamics and economic weaknesses appear to be the sources of Russia's failure to move forward on a variety of chemical weapons arms control undertakings. With respect to chemical weapons, Russia still holds at least its declared 40,000 ton stockpile and, for a variety of more and less credible reasons, has not begun to destroy it. There are reports that the Russians may still be developing or producing chemical weapons. All of these problems will be more profitably dealt with through Russian participation in the CWC.

Contrary to the assertion that the United States should not act absent a virtual guarantee of Russian CWC participation, U.S. ratification is a critical step to getting Moscow on board. The provision of U.S. financial assistance and technical advice to Russia's chemical weapons destruction program is also vitally important in affecting Russian behavior. Entry into force of a CWC bolstered by the full weight of U.S. power and prestige would immediately and publicly test the authenticity of Russian civilian and military assurances that Moscow's commitment to chemical weapons disarmament remains unchanged. Russian leaders would face a stark choice: Ratify the CWC and play an appropriate great power role, or renege and accept the international opprobrium, diminished political voice in chemical disarmament matters, and loss of access to the trade in CWC-controlled chemicals.

Not only will U.S. ratification exert strong, possibly determining pressure in support of Russian ratification, without it, Russian ratification is improbable. If the CWC entered into force without the world's two largest chemical weapons possessors, it would be a hollow treaty. Absent U.S. and Russian participation, other nations, such as China, may balk. While eventually such reluctant nations may join the CWC, the damage to the CWC's long-term viability could already have been done. In capitols around the globe, doubts would begin anew about how much value the United States and Russia place on the CWC and, correspondingly, how well might it serve the security interests of others.

An evolution in U.S. chemical weapons policy coincided with the final years of the CWC negotiations. Under a 1985 congressional mandate, the long process of destroying the U.S. chemical weapons stockpile began in earnest in 1990. The U.S. government concluded that maintenance of a chemical arsenal is unnecessary, even while chemical weapons are still held by others. Deterrence of chemical attack can be as or more effectively obtained through other means, such as the restrictions imposed by arms control on the capabilities of potential adversaries and the maintenance of conventional military capabilities responsive to a range of contingencies. To many governments, the U.S. unilateral renunciation of chemical weapons made a powerful statement, influencing their assessments of military requirements and hence their support for the CWC. In significant if unmeasurable ways, this act gave common sense credibility to the moral arguments against chemical warfare.

A CWC without the United States would not immediately collapse, particularly if the circumstances of non-ratification could be credibly attributed to temporary factors such as partisan politics, the particular role of key personalities, or linkages with unrelated other Senate issues.

However, as the effect of U.S. immobility on the CWC facilitated similar behavior by other countries, the CWC would become significantly less able to constrain chemical weapons proliferation.

Other efforts to restrain weapons of mass destruction might falter as well. For example, biological weapons are considerably tougher to control and monitor than chemical weapons. Though quite different in many respects, the two kinds of weapons are popularly compared, and it is predictable that the current effort to strengthen the Biological and Toxin Weapons Convention would be set back by Senate inaction on the CWC.

Also, in a world where weapons of mass destruction are more widely proliferated and regional security balances consequently more tenuous, the United States would eventually have to reassess the adequacy of its own defense and response capabilities. In short, the un-making of the CWC could have consequences well beyond the chemical arms control arena.

Conclusions

The path to a CWC has been arduous because the security stakes are high. The consequences of not addressing the problem of chemical weapons proliferation spurred two Republican administrations, with broad support from Congress, to introduce the policy breakthroughs and conduct the quiet but essential off-line diplomacy necessary to obtain the CWC. The Reagan and Bush administrations marshalled the resources of the U.S. diplomatic, military, chemical industry, and academic communities so that the United States could play a positive, determining role in crafting a treaty to enhance the security of future U.S. generations. Presidents Reagan and Bush asserted a commitment of active U.S. leadership from which it seemed clear there would be no retreat. The irony of such a retreat now would be inescapable.

No single event or country will shatter the CWC or guarantee its durability. But the timing and outcome of the Senate's ratification debate will significantly influence the treaty's prospects for success. Whatever its level of engagement in world affairs, America's pursuit of security, prosperity, and an international environment congenial to U.S. values will be rendered significantly more manageable by the early entry into force of the CWC and continued, committed U.S. leadership in all aspects of its implementation.

The Ramifications of Senate Inaction in the Hague

Amy E. Smithson

A new international agency is being created in the Hague from the ground up to analyze the data declarations, conduct routine and challenge inspections, oversee the safe destruction of chemical arsenals, and otherwise administer the Chemical Weapons Convention (CWC). This agency, which will be christened the Technical Secretariat once the CWC enters into force, is the organization to which the treaty members will turn in the years and decades ahead to investigate concerns about treaty compliance. Non-ratification and non-participation by the United States in the Technical Secretariat would badly impair this start-up monitoring agency, making recovery extremely difficult.

For better or for worse, the CWC's Technical Secretariat is often compared with the only other international arms control monitoring agency in existence, the International Atomic Energy Agency (IAEA). The IAEA was founded in 1957 to assist nations in developing peaceful uses of the atom. In 1970, when the Nuclear Non-Proliferation Treaty (NPT) entered into force, the IAEA was tasked with conducting the NPT's safeguards inspections. Unlike the IAEA, the Technical Secretariat will not be providing technical assistance to developing countries. The CWC requires an open commercial chemical marketplace among member states, but nations are not to receive technical assistance in exchange for forgoing chemical weapons. In the event a treaty party is threatened with or suffers a chemical weapons attack, the Technical Secretariat will offer defensive and medical assistance.

Another important difference between the Technical Secretariat and the IAEA involves the treaty provisions under which they operate. NPT members agree to safeguards inspections at *declared* nuclear research and power facilities but do not assume a specific commitment to host special inspections to clarify anomalies that arise from declared information, safeguards inspections, or other sources of information. The IAEA may request a special inspection, but the NPT member may deny permission for it. In contrast, members of the CWC undertake the explicit obligation to accept challenge inspections, which can be conducted at *any* site and at *any* time. A treaty member can request a challenge inspection based upon its own intelligence information or questions ensuing from routine inspections or data declarations. Refusal of a challenge inspection would constitute a violation of the CWC. Thus, the automaticity and strict time lines incorporated into the CWC's challenge inspections put the CWC's inspectors in a stronger position than their IAEA counterparts.

The Technical Secretariat is to be built in two phases, the first of which began early in 1993. Since then, the Technical Secretariat in its provisional form has been assisting a technical and policy decisionmaking body known as the Preparatory Commission (PrepCom). The PrepCom, which takes its decisions by consensus, was charged with translating the treaty's text into the policies and procedures that will make the CWC a living, operational treaty. At present, the Technical Secretariat consists of some 120 specialists and administrators who support the work of the PrepCom and help signatories prepare for the CWC's entry into force. Both the PrepCom and the budding Technical Secretariat are located in the Hague, the Netherlands.

While the CWC is a remarkably detailed treaty, its text still requires further elaboration of the procedures and equipment that are needed for the conduct of inspections. Thus, the PrepCom has been making decisions about the format and processes for data declarations; procedures to be used during routine inspections of declared sites (e.g., former chemical weapons production facilities, industrial facilities using dual-use chemicals, and chemical weapons storage sites) and challenge inspections of suspect sites; the Technical Secretariat's structure, regulations, and staff qualifications; procedures to maintain the confidentiality of information; design and purchase of the computer database; planning and quality control of inspector training programs; and selection and procurement of required inspection, laboratory, and headquarters equipment. The importance of this work cannot be overstated. The PrepCom's decisions have implications for the treaty-related activities—declarations and inspections—that will occur at hundreds of military and government facilities and thousands of commercial chemical plants worldwide.

All of the CWC's signatories can participate in the PrepCom, but once 65 ratifications have been deposited to initiate the treaty's entry into force, signatories that have not ratified will lose much of their influence in the crucial decisions to be made in the final six months before the CWC's activation. As often happens during negotiations, some of the most vexing yet important issues have been left for resolution in the final stage of the PrepCom process. The only way a government can maintain its leverage in decisionmaking and the eligibility of its citizens for employment at the Technical Secretariat is to ratify the CWC.

The deposit of the 65th instrument of ratification kicks off the second phase of the Technical Secretariat's creation. Within six months, the Provisional Technical Secretariat must hire and train the inspection corps and additional support staff. The reason for this breakneck pace is that 180 days after the 65th ratification, the CWC enters into force. Participating states are to begin submitting their data declarations for all chemical weapons activities and industry facilities using treaty-controlled chemicals. Over the next 30 days, the Technical Secretariat must digest and analyze this mountain of information in order to begin conducting its first inspections at chemical weapons storage and production sites, as well as at some industrial facilities, on the 31st day after the CWC's entry into force. From that point on, the Technical Secretariat must also be prepared to execute a challenge inspection immediately upon the request of a member state.

This set of circumstances gives rise to two basic scenarios for what is likely to occur in the Hague if the U.S. Senate continues to postpone consent to ratification. The first scenario, which hinges on the assumption that the international community will not move forward in this effort without the United States, forecasts that the CWC and the Technical Secretariat will languish indefinitely, to the detriment of both. In the second scenario, the CWC enters into force without the United States, and Washington will be shut out of the Technical Secretariat for the near term. Either way, the United States ends up on the sidelines, poorly positioned to address the problem of chemical weapons proliferation.

Scenario 1: CWC On Hold

The establishment of any new institution is a difficult task. In the Technical Secretariat's case, the exercise is even more complicated because the agency's staff will be recruited from all of the CWC's participating states. Although the Technical Secretariat's personnel must meet fairly exacting qualification standards, the overall staff must nonetheless be geographically balanced. Because this agency will be conducting inspections of a depth and scope never before attempted internationally, the Technical Secretariat is also being put together with more than a normal amount of second-guessing and criticism. Another factor that has placed this endeavor under scrutiny is that even though it has only a short track record of its own, the Technical Secretariat is saddled with the reputation that other international organizations have gained for waste, fraud, and abuse. To head off similar criticism, the PrepCom has levied severe limitations on the Technical Secretariat's staffing and budgeting. The Provisional Technical Secretariat has been put together on a shoestring budget, and although the number of prospective sites and the workload merit a bigger inspection corps, the PrepCom has refused to authorize additional personnel. Thus, to begin with, the Technical Secretariat will hire an inadequate number of inspectors.

If events had unfolded as many had predicted when the CWC opened for signature in mid-January 1993, 65 ratifications would have quickly accumulated, and the CWC would have entered into force early in 1995. This outcome was predicated on the assumption that the United States would continue its strong leadership role in the arena of chemical weapons arms control and nonproliferation. After all, Washington led the international community to this take-off point by proposing a revolutionary draft text in 1984 and alternately cajoling and pushing other countries over the next eight years to conclude the CWC. America's participation was viewed as especially important because the United States possessed a huge chemical arsenal as well as an immense chemical industry. After the Soviet Union's collapse, the United States was also the only remaining superpower. Therefore, many nations looked for U.S. ratification of the CWC as their cue to initiate their own ratification processes.

Had this prediction come true, the Technical Secretariat would have entered into phase two of its establishment in mid-1994. The lengthy U.S. delay in ratification has meant, however, that the pace with which other states have ratified has been much slower than expected. Many governments have apparently concluded that the CWC loses much of its meaning if the United States and Russia, which have the world's two largest chemical weapons stockpiles, do not lead the way. Consequently, the deliberations in the PrepCom and the Provisional Technical Secretariat's preparations to grow into a full-fledged inspectorate have gone into a state of suspended animation. In other words, phase one activities have lasted a year longer than was initially planned.

While the Provisional Technical Secretariat's staff has taken full advantage of this extension to refine its plans and preparations, continued delay will be damaging. For example, the screening of applications and interviewing of candidates for the 170 inspector positions and additional support staff began in the spring of 1995. Current plans called for hiring to begin by the end of 1995. The best applicants have been identified, but this short list of choice candidates is perishable. The success of an organization rests primarily on the talents of its staff. If the U.S. Senate does not soon give its consent to ratify the CWC, the Technical Secretariat will lose its opportunity to hire the most qualified inspectors and staff. Most candidates will choose to do something else with their lives instead of waiting indefinitely for a telephone call from the Hague.

Similarly, the training programs for the inspectors are scheduled to begin in early 1996. To provide thorough and realistic training for the inspection corps, several signatory governments have set aside facilities, including, with the continued cooperation of chemical industry, commercial plant sites. Additional delays will cause some governments to cancel their offers of training programs, again because neither a government nor its private sector can have people and facilities on hold for several months. The sum of these delay-related consequences is that the recruiting and training processes would have to be re-initiated later at additional cost.

At a certain point, the continuation of the Provisional Technical Secretariat itself becomes doubtful. The core of this would-be agency is its Verification Division. Particular care has been taken with the selection of the staff for this part of the Provisional Technical Secretariat. Many are veterans of the United Nations Special Commission in Iraq or have other equally unique qualifications and experiences. If this state of suspended animation drags on for too long, the skeletal staff of the Verification Division, which at this point constitutes the Provisional Technical Secretariat's biggest asset, may also begin to fall apart.

During this long hiatus, the PrepCom has continued to plod along. Given more time and few actual tasks, governments that were dissatisfied with the CWC's verification provisions will find more opportunity to water them down via the PrepCom process. For example, some states have advanced proposals to limit the intrusiveness of inspections by defining the parameters of the sampling and detection equipment as narrowly as possible, thereby restraining the range of anomalies that inspectors could identify. Some delegations in the Hague will also try to handicap the Technical Secretariat by imposing on it a level of detail in rules and regulations that are impractical for field operations. In short, a PrepCom with too much time on its hands could render the eventual Technical Secretariat impotent.

Whether PrepCom participants would, at some point in the future, support starting the whole recruitment, hiring, and training process over again is uncertain. In all likelihood, the PrepCom participants, pushed by economic constraints and unsure of when the CWC would come into force, would cut the Provisional Technical Secretariat's budget further. At the very least, the current Provisional Technical Secretariat would be whittled down considerably.

Scenario 2: Entry into Force Without the United States

Another possible result of continued Senate procrastination is becoming increasingly plausible. In this scenario, a sufficient number of ratifications are deposited to enable the CWC's entry into force, absent the United States and Russia.

Many U.S. policymakers are confident, perhaps unwisely so, that the CWC cannot take off without Washington. A quick glance at the list of countries that have already ratified the CWC—40 as of late October 1995—may shake the complacency of U.S. decisionmakers. Germany, Japan, Australia, Austria, Switzerland, Finland, Norway, France, Spain, and Canada are among the countries that have ratified the CWC. With these and other fiscally strong governments already committed, the Technical Secretariat has viability even though the United States would not be around to pay its assessed 25 percent of the inspectorate's budget. (In 1996, the U.S. assessment will be about $18 million. The United States spends four times that amount annually—$75 million—in operations and maintenance costs to store the U.S. chemical weapons stockpile. Other comparative defense expenditures include the $45 million price tag of an FA-18 aircraft and the $3.25 billion that United States invested in 1995 for theater and national ballistic missile defenses.) Without the extremely heavy burden of having to oversee both U.S. and Russian destruction chemical weapons programs, the Technical Secretariat could certainly begin inspections. Even if Russia were to confound conventional wisdom and ratify the CWC before the United States, the Technical Secretariat would still only have to hire an additional 25 or so inspectors.

The gradual swell in international momentum toward the CWC's entry into force is also evident by the ratifications of South Africa, Mexico, Argentina, Peru, Paraguay, Poland, Romania, Uruguay, Turkmenistan, Tajikistan, Bulgaria, Armenia, and Mongolia. Among another thirty countries that have indicated they will soon complete the ratification process are Belarus, Italy, Saudi Arabia, India, and the United Kingdom. Chemical weapons are so abhorred and the need to outlaw them so pressing that numerous governments are evidently not willing to continue waiting on the United States. In other words, there is a distinct possibility that the train will leave the station without Washington.

This scenario would indeed be the cruellest of ironies, for the United States would be shut out, at least temporarily, of the very entity that it sought to inaugurate. While the United States would retain its vote in the PrepCom, it would be held at arms length as the states that have ratified make quietly cut deals on the final crucial decisions about how the Technical Secretariat will execute the CWC's inspections. Actual votes on these issues are likely to be postponed until the first Conference of States Parties is held after the CWC enters into force. The United States will not have a vote in this decisionmaking body until it ratifies. Nor will the United States be eligible for a seat on the Executive Council, which will govern the CWC's implementation on a day-to-day basis. Depending upon which countries jump aboard at the last moment, the balance of votes could easily swing toward weakening the CWC's verification protocol. Furthermore, a majority of the CWC's signatories favor having this new organization adopt *carte blanche* the general financial and operational rules of the United Nations. These rules have contributed to the inefficiency of some international organizations, and the United States has played a key role in preventing their wholesale adoption. However, such views could carry the day if the United States were not involved in the decisionmaking process. Once in place, these decisions will be difficult to reverse.

In addition, U.S. nationals currently working in the Provisional Technical Secretariat would be told to pack their bags when the CWC enters into force. Furthermore, no U.S. citizens could be hired as inspectors until the United States ratifies, and all of the key jobs will be taken by the time the CWC enters into force. Between them, the United States and Russia have probably the largest pool of experts in chemical munitions production, storage, and destruction. Therefore, the Technical Secretariat would be forging ahead without some of the most qualified and experienced inspectors and chemical weapons specialists in the world. The individuals who are hired as inspectors or support staff will receive contracts for at least three years. Even if the U.S. Senate ratifies shortly after the CWC enters into force, there will be few, if any, positions left at the Technical Secretariat for Americans for a period of years.

Finally, until the United States deposits its instrument of ratification, the U.S. government would be denied formal access to the data gained through declarations and inspections. The CWC's entry into force was designed as a pay-to-play process, and Washington must ante up before it can review this information, which the intelligence community has testified would enhance its ability to assess the status of chemical weapons proliferation worldwide.

Conclusions

The Senate's torpid consideration of the CWC has already had a ripple effect in the Hague and around the globe, considerably slowing the rate of preparations and ratifications. Whichever scenario one finds more plausible, both have significant negative implications for the ability of the United States to act constructively to impede the proliferation of chemical weapons.

If global expectations of U.S. leadership are not fulfilled quickly, the christening planned for the Technical Secretariat could turn into its cortege. Many countries, whether rightly or not, have interpreted the Senate's lack of action since 1994 as puzzling, given Washington's declared concern about chemical weapons proliferation. Some governments may even construe the Senate's reluctance to ratify as a signal that the CWC has little relevance to world security; others may reconsider their decisions to forego chemical weapons. At the very least, the prolonged absence of U.S. leadership will decrease the global effectiveness of the CWC and the Technical Secretariat. In fact, perpetuation of the current circumstances could asphyxiate both the treaty and its inspection agency.

Or, the United States could be barred from the very control system that five U.S. administrations have worked so diligently to establish. In this manner, the United States could be deprived of useful avenues to influence how the CWC is implemented and the Technical Secretariat functions. Thus, the entry into force of the CWC without the United States has palpable consequences.

Clearly, U.S. interests will be better served by the Senate's timely move to reclaim America's role as a leader in international efforts to constrain chemical weapons proliferation and institute global chemical weapons disarmament. A skilled, well-equipped, well-trained, and respected Technical Secretariat is critical for the viability of the CWC. The Senate's prompt consent to ratification of the CWC and long-term support for a robust international inspectorate is in order.

Why We Need the Chemical Weapons Convention

H. Martin Lancaster

Chemical weapons have long been considered a particularly cruel and inhumane form of warfare. They are insidious and indiscriminate, striking down soldiers and innocent civilians alike. Indeed, this year's chemical attacks in Japan have underlined the grim fact that chemical weapons have increasing appeal for those who would attack and kill civilians.

Successive U.S. administrations have made the fight against chemical weapons proliferation a high priority. Beginning with President Richard Nixon, the United States has pioneered negotiations to ban chemical weapons internationally while moving unilaterally to eliminate the U.S. chemical weapons stockpile. With bipartisan support in Congress and active participation by U.S. chemical industry, five presidents worked to produce the most effective and comprehensive ban on chemical weapons that could be negotiated, the Chemical Weapons Convention (CWC). In November 1993, President William Clinton submitted the Convention to the U.S. Senate with a strong recommendation for its advice and consent to ratification. Two years later, the Convention is still awaiting final consideration in the Senate.

Early this year, President Clinton selected me to serve as his administration's point man on ratification of the CWC and to help shepherd the treaty through the ratification process. During my eight years as a Congressman from North Carolina, I became deeply interested in the efforts of the international community to ban these abhorrent weapons. Consequently, I welcomed the opportunity to make the case for this vital accord.

The Need For A Ban

The need for a global ban on chemical weapons is even greater now than a few years ago when I was monitoring the CWC negotiations in Geneva. Iraq's threat during the Persian Gulf War to launch chemical attacks against Saudi Arabian and Israeli cities and the recent incidents of chemical terrorism in Japan show that chemical weapons are proliferating and pose a real danger to world security.

Today, we suspect more than 25 countries of having chemical weapons or the capability to produce them. These weapons are attractive to countries or individuals seeking a mass-destruction capability because they are relatively cheap to produce and do not demand the elaborate technical infrastructure needed to make nuclear weapons. It is therefore all the more vital to establish an international bulwark against the acquisition as well as the use of these weapons. Equally important, we must do all that we can to prevent the acquisition and use of these terrible weapons within our own borders. As required by the CWC, domestic legislation and law enforcement will be an integral part of the effective implementation of the CWC by each member state.

The CWC enjoys broad international support. As of October 1995, the CWC has been signed by 159 of the 185 members of the United Nations. The signatories include nearly three quarters of the countries we suspect of possessing or seeking to acquire chemical weapons.

Before the treaty can enter into force, however, 65 signatory-states must ratify it. So far, 40 countries have done so. Many more are waiting for the United States to ratify, with the intention of following our lead. I believe that once the Senate approves the treaty, the number of ratifications needed for entry into force could be reached in a matter of months, if not weeks.

Unique Scope

The CWC is the most ambitious treaty in the history of arms control. It bans the full spectrum of activities associated with the offensive use of chemical weapons, including the development, production, acquisition, stockpiling, transfer of chemical weapons, as well as assistance to anyone engaging in these activities.

Whereas most arms control treaties have only limited weapons, the CWC requires their outright elimination. Parties to the CWC must destroy any and all chemical weapons and chemical weapons production facilities. In the United States and Russia alone, the CWC will require the destruction of between 60,000 and 70,000 tons of deadly chemical agents.

In addition, chemical industry sites that produce "dual-use" chemicals that have both military and commercial applications will be monitored by an international inspectorate to ensure that chemical weapons are never again produced or acquired.

The CWC breaks new ground with the sweeping nature of its prohibitions and in the scope and effectiveness of its verification provisions, which include data declarations and routine and challenge inspections. This regime reflects a carefully crafted balance between the intrusiveness needed to verify treaty compliance, on the one hand, and the measures needed to protect confidential business information and national security information, on the other.

The CWC is also the first treaty that penalizes countries that do not join while rewarding those that do. Entry into force of the CWC will isolate the small number of non-participating states as international pariahs and inhibit their access to certain treaty-controlled chemicals. Since many of these chemicals are not only required to make chemical weapons but have important uses in commercial industry, the hold-outs will have economic as well as political incentives to join the treaty regime.

Countries that ratify the CWC and comply fully with its provisions will not face these restrictions. They will also be eligible for humanitarian aid and protective assistance if they are victimized by the use or threatened use of chemical weapons. These built-in carrots and sticks will help promote universal adherence and compliance.

Industry Involvement

The CWC is the first arms control treaty to have an impact on a significant portion of the private sector. Although U.S. industry does not manufacture chemical weapons, it does produce, process, and consume a number of chemicals that can be used to make chemical weapons. For example, a solvent used in ballpoint-pen ink can be easily converted into mustard gas, while a chemical involved in production of fire retardants and pesticides can be used to make nerve agents. Thus, any treaty to ban chemical weapons must monitor commercial facilities that work with dual-use chemicals to ensure they are not diverted for prohibited purposes.

The CWC's provisions covering commercial chemical facilities were developed with the active participation of industry representatives. During my visits to Geneva, I became aware of the extensive involvement in the negotiations of U.S. industry, in particular, the Chemical Manufacturers Association (CMA). CMA representatives met regularly with the U.S. delegation to convey industry's views—particularly on the protection of proprietary information—and to offer constructive suggestions.

Acting in enlightened self-interest, together with other chemical trade associations from Europe, Australia, and Japan, the CMA helped to craft an effective yet industry-friendly verification regime. This regime is intrusive enough to build confidence that member states are complying with the treaty, yet it respects industry's legitimate interests in safeguarding proprietary information, avoiding disruption of production, and ensuring a level playing field for global competition.

As President Clinton said in May 1995:

> In industry meetings, public forums, and congressional hearings, the Chemical Manufacturer's Association was an early and consistently strong supporter of the Chemical Weapons Convention. Any one of [CMA's] activities would be deserving of praise; together they represent an extraordinary sustained commitment to eliminating the threat of chemical weapons, a goal that is central both to our nonproliferation policy and to broader world security.

Overall, the successful government-industry partnership that emerged during the Geneva negotiations provides a model for future cooperation. As the entry into force of the CWC approaches, industry's role has not diminished but has become all the more crucial. Industry's efforts to help rid the world of chemical weapons are an outstanding demonstration of corporate responsibility and good citizenship—one that will strengthen U.S. national security and enhance the public image of American business.

The Need for Prompt Ratification: The Costs of Delay

The urgent need for entry into force of the CWC warrants prompt action by the U.S. Senate in giving its advice and consent to ratification. The arguments for U.S. ratification are compelling. Let me highlight some of the major ones:

First, with or without the CWC, the United States has decided to get out of the chemical weapons business. Congress has already passed a law requiring destruction of the entire U.S. chemical weapons stockpile by the end of the year 2004. The CWC would require all other parties that possess chemical weapons to do the same. If we fail to ratify and the CWC does not enter into force, we would deny ourselves the benefit of having other countries legally obligated to eliminate weapons that we ourselves have unilaterally decided to renounce and destroy.

Second, the CWC will put into place a legally binding international norm outlawing the acquisition and possession, as well as use, of chemical weapons. Although universal adherence and the complete abolition of chemical weapons will not be achieved immediately, the CWC will slow and even reverse chemical weapons proliferation. The CWC will isolate the small number of states headed by rogue leaders that refuse to join the regime, limit their access to precursor chemicals, and bring international pressure to bear if such states continue their chemical weapons programs.

In this regard, the CWC is both a disarmament and a nonproliferation treaty. It not only requires states parties to destroy their chemical weapons arsenals but prohibits them from transferring chemical weapons to other countries or assisting anyone in activities prohibited under the CWC. Combined with restrictions on chemical trade in CWC-controlled chemicals with non-parties, these provisions will increase the cost and difficulty of acquiring chemical weapons for states that choose not to participate.

Further delay in U.S. ratification and entry into force puts off the day when current trends in the acquisition and use of chemical weapons will be met with broad international opposition; the chemical weapons proliferation threat will persist unabated. And, although it is unlikely the CWC would enter into force without the U.S. and Russia, there is at least a small risk that if the U.S. continues to delay ratification, we may find ourselves on the receiving end of the CWC's trade restrictions after entry into force.

Third, although no treaty is 100 percent verifiable, the CWC's extensive verification measures will significantly increase the chances that a violation will be detected, raising the political cost of illicit chemical weapons activities and helping to deter them. Challenge inspections require access on short notice to address concerns about compliance. Additionally, as former Director of Central Intelligence James Woolsey told the Senate last year, the CWC will provide valuable information not otherwise available about chemical weapons-related activities around the world, complementing unilateral U.S. monitoring efforts. Continued delay in U.S. ratification and entry into force of the CWC will deny the United States access to facilities that have raised concerns. Delays also deprive the United States of needed information not otherwise available, that would help facilitate monitoring and detection of chemical weapons-related activities.

Fourth, the CWC has won the endorsement of the nation's senior military leaders. Gen. John Shalikashvili, the Chairman of the Joint Chiefs of Staff, has testified that the CWC is "clearly in the national interest." He has argued that once the treaty is in force, U.S. troops will be less likely to face chemical weapons in future wars. Even if they do, the Gulf War demonstrated that the United States does not need the option of retaliation in kind to deter or defend against chemical weapons use by others. Instead, the ability to apply superior military force in any situation, combined with robust chemical defenses, is sufficient for this purpose. Delayed U.S. ratification and entry into force of the CWC means that chemical weapons will remain an undiminished threat to U.S. soldiers on the battlefield.

Fifth, the CWC will help combat efforts by terrorists to acquire and use chemical weapons. The CWC denies terrorists access to a ready supply of chemical weapons by requiring parties to eliminate their national stockpiles and by restricting trade in treaty-relevant chemicals. The CWC also requires member-states to enact domestic legislation making the treaty provisions binding on individuals and businesses, including their nationals living abroad, and imposing civil and/or criminal penalties for violations.

This opportunity to enhance U.S. law enforcement tools and judicial capabilities for dealing with chemical terrorism should not be lost. The CWC's implementing legislation establishes specific criminal offenses and penalties for activities associated with chemical weapons, including their acquisition, production, possession, and transfer. The codification of more precise legal definitions would improve our current investigative ability to detect illegal preparations for a chemical terrorist attack—and by implication to avert such an attack—and to prosecute these activities, including conspiracy in a chemical terrorist plot. In this manner, prompt ratification of the CWC and approval of its implementing legislation will materially strengthen the ability of U.S. law enforcement agencies to detect and prevent activities associated with chemical terrorism.

In addition, the CWC provides for enhanced international cooperation in information sharing and law enforcement in the fight against chemical terrorism. The sincerity of U.S. purpose, the depth of our commitment to stop chemical weapons proliferation and ongoing efforts by the United States to generate cooperative counterterrorist programs with foreign nations would be dramatically reinforced by U.S. ratification of the CWC.

Finally, it has been argued that concerns about Russia's chemical weapons capabilities and its failure to develop an effective plan for destroying its vast chemical stockpile are reasons for the U.S. Senate to reject the CWC. I would argue just the opposite: The best way to resolve our concerns over the status of Russia's chemical weapons capabilities is for the U.S. to ratify the Convention promptly. As Russian whistleblower Dr. Vil Mirzayanov recently argued:

> ... the CWC provides the means to bring the Russian chemical weapons complex under international monitoring. ...The key to confronting all these [chemical weapons] problems lies in the CWC; there is no time to waste in ratifying and implementing this important treaty.

The CWC will place Russian chemical activities under intense international scrutiny and empower the world community to respond to any concerns about noncompliance with intrusive verification measures, political pressure, and possible sanctions. U.S. ratification of the CWC and its subsequent entry into force will present Russia with a clear choice between joining a legally binding regime that bans chemical weapons or isolating itself from a global consensus.

Conclusions

Clearly, the Chemical Weapons Convention is a treaty whose time has come. It is in our security interest for the CWC to enter into force promptly and be implemented successfully. The CWC is designed to bring about the destruction of chemical weapons stockpiles around the world and impose strict verification measures to ensure that they are not replenished. It will increase the cost and difficulty of acquiring chemical weapons, even by countries that do not join the regime, thus helping to slow or reverse chemical proliferation. It will generate useful information about chemical weapons-related activities, past and present, complementing and enhancing our current knowledge of these activities. And, it will help in the fight against chemical terrorism.

The CWC has broad bipartisan support within the United States and growing international support, as evidenced by the 40 ratifications already in hand. The world is waiting for the United States to ratify, in the expectation that U.S. ratification will quickly lead to entry into force and implementation of its tough requirements.

I urge the Senate to consider carefully the costs to our national security of further delay, indeed, to the safety of our citizens and our troops, and to move swiftly to provide consent to this important treaty. The United States has led the fight against these terrible weapons for too long to allow the world's proliferators the upper hand. We must complete the work begun by President Nixon more than 25 years ago and eliminate the threat to world security from these terrible weapons.

About the Authors

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John Glenn is currently serving his fourth term as the Democratic senator from Ohio. For twenty-three years Senator Glenn served in the United States Marine Corps, including tours in both World War Two and the Korean War. After several years as a test pilot, in 1959 he was selected as one of the original seven astronauts in the U.S. space program. In 1962, he was the first American to orbit the earth. After retiring from military service, Senator Glenn was an executive with Royal Crown International, before being elected to his first term as senator in 1974.

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About the Project

The Chemical Weapons Convention (CWC) is a multilateral treaty of unprecedented scope and complexity that is designed to prohibit the development, production, acquisition, stockpiling, retention, and use of chemical weapons. In conjunction with the January 1993 signing ceremonies in Paris, the Henry L. Stimson Center launched a new project to serve as an information clearinghouse and to monitor domestic and international preparations to implement the treaty.

The project publishes a periodic newsletter, *The CWC Chronicle,* to help government, industry, the diplomatic community, and interested observers keep abreast of important developments in the CWC Preparatory Commission.

The Center assembled a group of experts from the International Atomic Energy Agency (IAEA), an oft-cited model for the CWC's new international monitoring agency, to consider how best to build such a monitoring agency from scratch. Their recommendations were published in an occasional paper, *Administering the Chemical Weapons Convention: Lessons from the IAEA* (April 1993).

Given the CWC's significant reporting and inspection requirements for commercial chemical industry, the Stimson Center gathered a group of industry experts to solicit their thoughts about these requirements. Their recommendations are contained in the January 1994 report, *Implementing the Chemical Weapons Convention: Counsel from Industry.*

A report entitled *The U.S. Chemical Weapons Destruction Program: Views, Analysis, and Recommendations* (October 1994) explores the controversies associated with the U.S. Army's incineration program, turns a critical eye to the charges made by the opponents to this program, and provides recommendations to facilitate citizen participation in the decision making process and improve oversight of the Army's program.

Another publication, *The Chemical Weapons Convention Handbook*, describes the basic components of the treaty and provides other introductory information.

The project's most recent report, *Chemical Weapons Disarmament in Russia: Problems and Prospects* (October 1995), included the first, public in-depth discussion of security shortcomings at Russia's chemical weapons storage facilities and the most detailed account ever published of the controversial chemical weapons development program of Soviet origin by the individual who blew the whistle on it, Dr. Vil Mirzayanov. In addition, the report provided discussion and analysis of the tools available to address these problems, including the CWC and the Cooperative Threat Reduction program.

The Carnegie Corporation of New York funds this project, which is directed by Amy E. Smithson.

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 3a.

Nonproliferation Center

The Weapons Proliferation Threat

March 1995

The Weapons Proliferation Threat

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Scope Note

This paper was prepared by the Nonproliferation Center. It was drawn from Intelligence Community-coordinated unclassified material from the 1994 Annual Nonproliferation Report to the US Congress and from recent testimonies before Congress by senior Intelligence Community officials.

The Weapons Proliferation Threat

Introduction

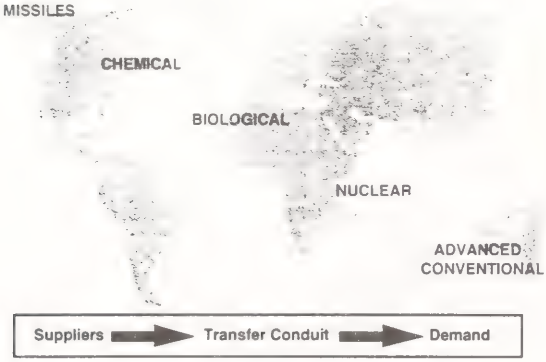
Few international dangers confronting the United States have more serious and far-reaching implications for national security and worldwide stability than the proliferation of weapons of mass destruction (WMD).

The legendary Chinese master of military strategy, Sun Tzu, is reported to have said that the best method of preserving security is to avoid direct battle and instead attack the enemy's plans and strategies. That, in essence, is a fundamental principle of the nonproliferation policy of the United States. If we can determine and understand the plans and intentions of would-be proliferators of weapons of mass destruction, and then frustrate those plans before they reach fruition, we will have preserved the security of our nation without having to confront the devastating power of the weapons themselves.

The proliferation of WMD is a global problem that cuts across geographic, political, and technological lines. It involves some of the largest and smallest, richest and poorest countries led by some of the most reactionary and unstable regimes. Many potential proliferators are convinced that they need to develop WMD and associated delivery systems to protect their national security.

Proliferation -- A Global Problem

Geographically, Technologically, and Politically



Many of the technologies associated with WMD programs have legitimate civilian or military applications unrelated to WMD. This paradox makes it difficult to restrict trade in those technologies because developing nations have legitimate needs for them. For example, chemicals used to make nerve agents are also used to make plastics and to process foodstuffs. A modern pharmaceutical industry could produce biological warfare agents as easily as vaccines and antibiotics. And much of the technology needed for a ballistic missile program is the same as that needed for a space launch vehicle program. As potential proliferating countries' economies improve and their industrial bases mature, however, their dependence on foreign technologies necessary for WMD will be reduced, making early detection and interdiction of new programs increasingly difficult.

At least 20 countries—nearly half of them in the Middle East and South Asia—already have or may be developing weapons of mass destruction and ballistic missile delivery systems. Five countries—North Korea, Iran, Iraq, Libya, and Syria (see country profiles, Annex A)—pose the greatest threat because of the aggressive nature of their WMD programs. All five already have or are developing ballistic missiles that could threaten US interests.

Some of these countries also reexport newly acquired and newly developed technologies or equipment to third countries. Worsening economic conditions and the lure of lucrative foreign sales will encourage other states or firms to engage in WMD-related technology transfers. To these technical and economic reasons, you need only add the political, territorial, and ideological ambitions present in the Middle East to understand the rapid increase in the number of WMD programs in the region. In recent years, an even more troubling issue—the potential for smuggling nuclear weapons or nuclear-related material from the former Soviet Union—has contributed to the growing proliferation problem.

Ballistic Missiles

The spread of ballistic missile systems and missile production technology is a global problem. Developing states in the Middle East, South Asia, East Asia, Latin and South America either possess or have the intent to acquire ballistic missiles, with the object of deploying and, in some cases, marketing these systems. The most concentrated area of proliferation is centered in the Middle East, where Iran, Iraq, Israel, Syria, Egypt, Saudi Arabia, and Libya all possess ballistic missiles.

The widening market for ballistic missiles and missile-related technologies over the past two decades has contributed to an increase in the types and number of suppliers. The growing list of suppliers includes organizations in China, North Korea, the industrialized states in Europe and South America, and in several Third World countries. Private consortiums are also among the suppliers of missile components and technologies. Iraq was able to establish its ballistic missile program through such suppliers.

Currently, only Chinese and Russian forces have the capability to strike the continental United States with land-based ballistic missiles. However, several countries are developing ballistic missiles that will have sufficient range to threaten Europe, Japan, and other US allies and US forces abroad. These missiles can be adapted to carry nuclear, biological, or chemical warheads. Possession of these missiles by potentially hostile countries will complicate US regional security concerns.

- Several countries have missiles *now* that could carry nuclear warheads; others are likely to have them soon. And if any one of these countries acquires even a few nuclear warheads, it would soon become an international threat.
- Most of the major countries in the Middle East have chemical weapons programs, and some have stockpiled weapons that could be used on short notice against civilians or poorly defended military targets.
- Most countries have not yet equipped their ballistic missiles to carry weapons of mass destruction, but over the next decade, many countries will—from North Africa through South Asia—if international efforts fail to curtail them.
- China and North Korea have already sold missiles to countries in the Middle East, and could sell longer-range versions and the technology to produce them. In that event, countries with existing special weapons programs will take on new, more ominous significance.

Cruise Missiles

Currently, only Russia can threaten the United States with land-attack cruise missiles; specifically the AS-15 air-launched cruise missile carried by the Bear H and Blackjack bombers, and the SS-N-21 submarine-launched cruise missile. Russian President Boris Yel'tsin, however, has claimed that SS-N-21s are no longer deployed on operational submarines.

Other countries are unlikely to develop the capability to directly threaten the United States with a substantial cruise-missile-based attack within the next decade. However, a number of countries will be able to threaten US interests abroad with these weapons within that time frame. Currently, land-attack cruise missile developments are under way in at least a dozen countries; many could be deployed by the year 2005. These programs vary in their level of sophistication and development, from the modification of existing systems, to the conversion of unmanned aerial vehicles for an attack role, to indigenous development of cruise missiles. A number of these countries will be either willing to export complete systems or to sell component technologies and development expertise to interested partners.

Chemical Weapons

A number of states continue to pursue the development or enhancement of a chemical weapons (CW) capability. Some states have chosen to pursue a CW capability because of the relatively low cost of—and low technology required for—CW production. Moreover, they believe that a CW capability can serve as both a deterrent to enemy attack and as an enhancement of their offensive military capabilities. Currently, at least 15 countries have an offensive CW program at some level of development. The most aggressive CW programs are in Iran, Libya, and Syria.

CW proliferation will continue to be a serious threat for at least the remainder of the decade, despite a number of arms control efforts, such as the Chemical Weapons Convention (CWC). Several countries of proliferation concern—including Libya, Syria, and Iraq—have so far refused to sign the CWC, and some CW-capable countries that have signed the CWC show no signs of ending their programs.

Biological Weapons

Many developing countries see biological weapons—like chemical weapons—as having a twofold utility: first, as a "poor man's atomic bomb" intended to deter attacks from stronger, unconventionally armed neighbors; and second, as a relatively cheap force multiplier that can help compensate for shortcomings in conventional arsenals.

Because much of the same biotechnology equipment employed by modern pharmaceutical programs or laboratories associated with modern hospitals can be used to foster a biological weapons program, identification of an offensive BW program can be extremely difficult. For example, most of the equipment used in BW-related programs has legitimate applications, providing potential proliferators with the ability to conceal BW activity within legitimate research and development (R&D) and industrial programs. The manufacture of vaccines for human or veterinary use can camouflage the production of large quantities of BW agents.

To counter the BW threat and protect legitimate biotechnology research interests, Australia Group members, including the United States, have adopted harmonized export controls on biological pathogens, toxins, and dual-use equipment. At the Biological and Toxin Weapons Convention (BWC) Special Conference, held in Geneva in September 1994, the US promoted the development of a legally binding instrument providing increased transparency of activities and facilities that could have biological weapons applications in order to help deter violations of, and enhance compliance with, the BWC.

Nuclear Weapons

US nuclear nonproliferation efforts were rewarded in 1994 and 1995 by the accession of new states to the Nuclear Nonproliferation Treaty, bringing the number of signatories to 172. Argentina is expected to sign the NPT sometime this year. In addition, after several months of sensitive negotiations, the United States purchased from Kazakhstan, and brought to Oak Ridge, Tennessee, for storage, 600 kilograms of highly-enriched uranium. As a result, that material is unavailable to nuclear traffickers and proliferating states.

Potential flashpoints remain, however. India, Pakistan, and several countries in the Middle East continue to refuse to join the NPT. China also remains an area of concern. Although Beijing has adhered to the NPT and requires IAEA safeguards on its exports, it has not adopted the export policies of the Nuclear Suppliers Group (NSG). Moreover, some Chinese firms continue to sell nuclear energy and research-related equipment to countries that have nuclear weapons programs.

The demise of the former Soviet Union created a number of potential proliferation problems for the United States and its allies. Illicit trafficking in nuclear materials has increased dramatically in the past few years, primarily in Germany and Eastern Europe. Although the vast majority of the incidents reported thus far have been scams or involved materials of no proliferation concern, a few instances since mid-1994 have involved actual nuclear-weapons-usable materials.

Incidents thus far have involved individuals or groups who apparently have acquired nuclear material through opportunistic access, rather than by specifically targeting facilities and materials. Security at nuclear-weapons-related facilities in Russia remains fairly stringent, but security at research facilities—from which most of the materials appear to have come—is much more lax. Material control and accountability at many facilities are poor.

The involvement of organized crime groups with sophisticated operations in nuclear materials trafficking would significantly increase the potential for significant weapons materials transfers to countries of proliferation concern. Efforts by such countries to target facilities or groups with access to nuclear materials would increase US and international concern over potential material transfers.

None of the incidents to date have involved enough nuclear material to produce a weapon, but the recent trend toward incidents involving larger quantities of material is disturbing. Analysis of technical data on all the incidents involving weapons-usable materials indicates they probably originated from research-oriented activities rather than from weapons activities.

Advanced Conventional Weapons

The proliferation of advanced weapons as well as such technologies as stealth, propulsion, sensors, and materials is accelerating military modernization in many areas of the world. The acquisition of advanced conventional weapons and technologies by hostile countries could result in significant casualties being inflicted on US forces or regional allies in future conflicts. Purchases of advanced conventional weapons also have the potential to rapidly change military capabilities in a region and may have threat implications that extend outside of the region.

- Iran, for example, took delivery of its second Kilo-class submarine from Russia last year, and may receive a third sometime this year. Several states in the Persian Gulf region have begun looking for antisubmarine warfare (ASW) weapons and platforms to counter Iran's submarines.
- The inclusion of submarine-launched cruise missiles, including the Exocet, probably was crucial to Pakistan's recent purchase of three French submarines. India, in response to Pakistan's acquisition of a submarine-launched Exocet, has indicated its desire to purchase a comparable system.

Growing global access to technologies and expertise, including dual-use technologies, to support weapons development will make it difficult to effectively control the spread of advanced weapon capabilities. Moreover, as countries' reliance on exports to maintain their defense industrial base grows, pressures will increase to export advanced conventional weapons and technologies to remain competitive with the United States in the world's arms market.

The US Intelligence Community response to the proliferation of advanced conventional weapons and technologies has been three-fold:

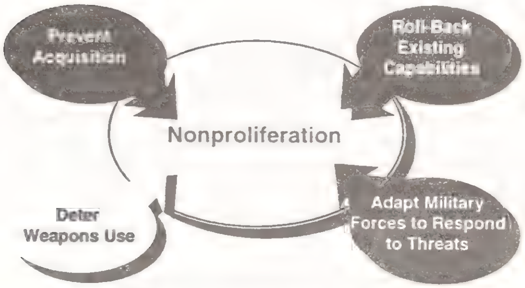
- Improving collection against both the buyers and sellers of advanced conventional weapons and associated technologies.
- Expanding threat analysis to include assessments of the potential threat to US forces from Third World forces that have acquired advanced conventional weapons and technologies.
- Examining more closely likely scenarios for future regional conflicts and countermeasure development for specific weapon systems.

Counterproliferation Efforts

US efforts to curb the spread of WMD, missile delivery systems, and advanced conventional weapons address four aspects:

- Preventing acquisition.
- Capping or rolling back existing programs.
- Deterring use of WMD.
- Ensuring US forces' ability to operate against proliferated weapons.

Four Aspects of Nonproliferation


Prevent Acquisition
Roll-Back Existing Capabilities
Nonproliferation
Deter Weapons Use
Adapt Military Forces to Respond to Threats

The United States has pursued initiatives to: reduce the incentives for states to develop such systems; prevent nations from acquiring the means to develop WMD and missile delivery systems; and establish binding agreements through which states can express their nonproliferation and disarmament commitments. These include the Nuclear Nonproliferation and Comprehensive Test Ban Treaties and the Chemical Weapons and Biological Weapons Conventions.

As the threat from proliferating countries has increased, US Intelligence Community capabilities have expanded to assess those countries' intentions and plans; to identify nuclear, chemical and biological weapons programs and clandestine transfer networks set up to obtain controlled materials or launder money; to support diplomatic, law enforcement, and military efforts to counter proliferation; to provide direct support for multilateral initiatives and security regimes; and to overcome denial and deception practices set up by proliferators to conceal their programs. The proliferation problem will continue to challenge US Intelligence Community assets as countries become more adept at concealing their programs and the supply routes they establish to support their activities.

Annex A

Country Profiles

North Korea

North Korea has invested heavily in its military and, in large measure, depends on arms sales for much of its hard currency earnings. Its copies of Soviet-designed Scud missiles are present throughout the Middle East, including Iran and Syria.

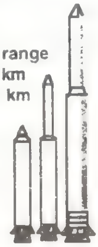
Ballistic Missiles: During the 1980s, North Korea reverse-engineered the 300-km-range Scud B missile and developed the 500-km-range Scud C missile. In addition, a 1,000-km-range missile, the No Dong-1, which was flight-tested in 1993, is in development. From Libya, this missile could reach Athens and Rome. Two new missiles, the Taepo Dong-1 and Taepo Dong-2, with ranges of several thousand kilometers, are also under development.

North Korea continues to pursue an aggressive ballistic missile development program. Past success in generating hard currency from missile sales also will motivate North Korea to continue to explore markets for its Scuds. However, P'yongyang's current ballistic missile systems are relatively inaccurate from a military effectiveness perspective. Development of more sophisticated guidance and control technology will be critical, especially if North Korea plans to deliver payloads other than weapons of mass destruction to longer ranges.

Ballistic Missile Proliferation: North Korea

- **Developing new missiles:**

No Dong = 1,000 km range
Taepo Dong I ≥ 3,000 km
Taepo Dong II ≥ 3.000 km



- **Can carry chemical, biological, and nuclear warheads**
- **Potential sales to Iran. Libya and other Middle East states**

Nuclear Weapons Program: Under the terms of the 21 October 1994 Framework Agreement with the United States, North Korea agreed to freeze its plutonium production capability. Currently, P'yongyang has halted operation of the 5 MW(e) reactor, ceased construction on two larger reactors, frozen activity at the plutonium recovery plant, and agreed to eventually dismantle these facilities.

Chemical Weapons Program: North Korea has an active chemical warfare program and produces a number of agents, including mustard and blister agents. P'yongyang has produced weapons carrying chemical agents.

Biological Weapons Program: Although it is a signatory to the Biological and Toxin Weapons Convention, North Korea has an active BW program in the early research and development stage.

Libya

Ballistic Missiles: Libya currently has only the 300-km-range Scud. Tripoli's indigenous missile program has been hobbled by international sanctions, which have forced Qadhafi to turn to lower-technology sources available on the gray and black arms markets. Credible reporting indicates that Libya is seeking to purchase a medium-range missile from North Korea.

Nuclear Weapons Program: Libya currently operates a small nuclear research center near Tripoli. Qadhafi reportedly is trying to recruit Russian nuclear scientists to assist in developing nuclear weapons, although it is doubtful that Tripoli could produce a nuclear weapon without massive foreign technological assistance.

Chemical Weapons Proliferation:
Libya

- **Libya has built, with foreign assistance, a large chemical weapon production plant at Rabta.**
- **A second CW production facility is under construction at Tarhunah.**
- **Libya has at least 100 tons of CW agents including mustard and nerve gas.**

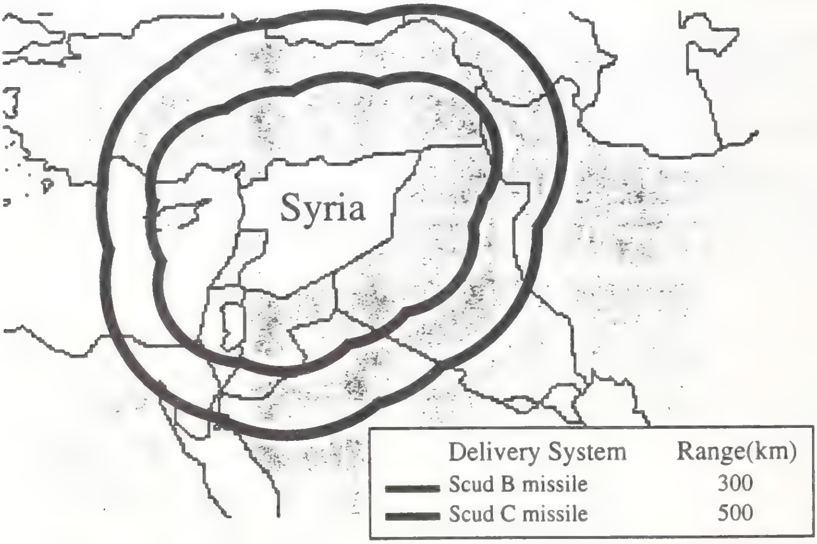
Chemical Weapons Program: Despite international outcries, Libya's CW program continues to flourish. An existing CW plant at Rabta, which previously produced up to 100 tons of CW agent, is inactive but remains capable of renewing production. The Libyans are building a second CW agent production facility underground in a mountainous area near Tarhunah, 65 kilometers southeast of Tripoli.

Biological Weapons Program: Libya's BW program is in the research and development phase and has not produced any biological weapons. A number of Libyan universities are being used for basic research of more common BW agents, but they are not equipped to perform the sophisticated work needed for weapons development.

Syria

Ballistic Missiles: Damascus has acquired from North Korea both the standard Scud B missiles with a range of 300 km and a smaller number of the 500-km Scud Cs.

Maximum Range of Syria's Deployed Ballistic Missiles



Nuclear Program: Syria signed the Nuclear Nonproliferation Treaty in 1969 and the IAEA Comprehensive Safeguards Agreement in May 1992. Damascus has an agreement with China, under IAEA sponsorship, to acquire a small 30-KW research reactor. Syria is not at this point seeking to develop nuclear weapons.

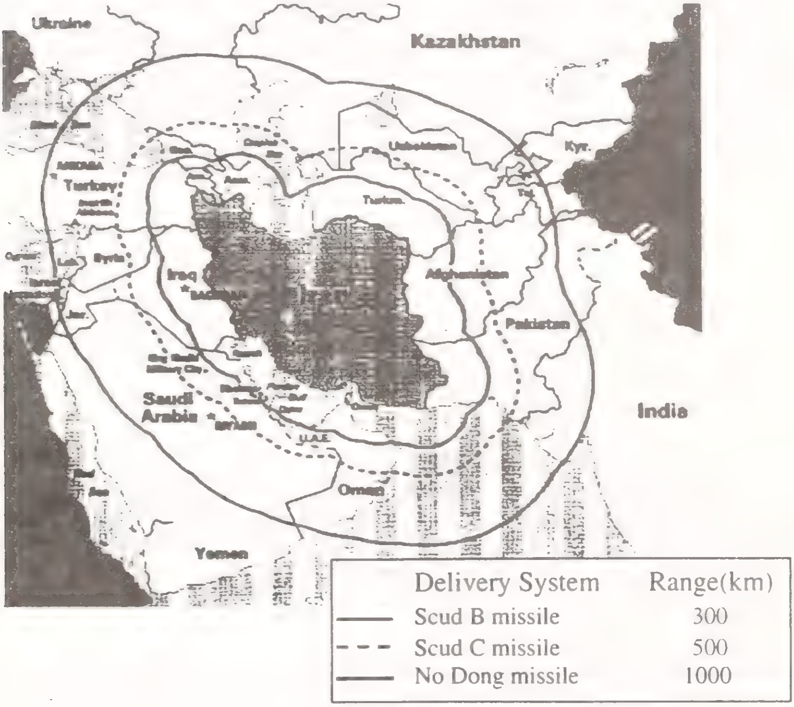
Chemical Weapons Program: Syria has had a chemical warfare program since the mid-1980s.

Iran

Iran continues to shop Western markets for nuclear and missile technologies. However, as Western export controls have become more effective, Tehran has turned to Asia as its principal source of special weapons and weapons technology.

Ballistic Missile Program: Tehran continues to add to its inventory of ballistic missile delivery systems, which includes Scud Bs and Cs purchased from North Korea. Iran also reportedly is seeking to purchase a longer-range missile from North Korea, the No Dong -1.

Maximum Range of Iran's Planned Ballistic Missiles



Nuclear Weapons Program: Iran is aggressively pursuing a nuclear weapons capability and, if significant foreign assistance were provided, could produce a weapon by the end of the decade. Tehran is devoting significant resources to its nuclear program. Foreign suppliers, including Russia and China, are key sources of necessary technologies not only for Iran's nuclear program but also for its other WMD capabilities.

Chemical Weapons Program: Iran has continued to upgrade and expand its chemical weapons production infrastructure and chemical munitions arsenal, despite signing the CWC in January 1993. Iran produces a variety of chemical agents, including blister, blood, and choking agents. As part of this expansion, Iran is spending large sums of money on long-term capital improvements to its chemical warfare program, suggesting that it intends to maintain a CW capability well into the future.

Biological Weapons Program: Iran has had a biological weapons program since the early 1980s. The program currently is in the late stages of research and development. Iran has the technical infrastructure to support such a program. It conducts top-notch legitimate biomedical research at various institutes. Because Iran can also produce a number of veterinary and human vaccines, it also has the capability to produce biological warfare agents.

Iraq

Iraq remains a formidable WMD problem. Saddam built major programs in all four areas of WMD. The UN Special Commission (UNSCOM) is working diligently to eliminate Baghdad's programs, but Saddam is determined to acquire weapons of mass destruction and he repeatedly has dug in when the Commission gets close to uncovering something he wants to protect.

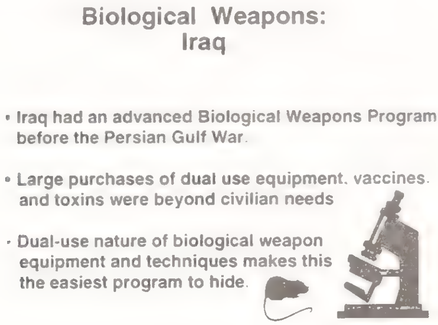
Operation Desert Storm did significant damage to Iraq's WMD programs. And, for now, UN sanctions—which prevent the purchase of needed equipment and materials—and inspections, which deter ongoing research and production for fear of discovery, keep Baghdad from restarting the bulk of its WMD programs. However, Iraq's special weapons programs are not beyond recovery. Enough production components have been hidden from UN inspectors to enable Iraq to resume development or production of chemical, biological, and nuclear weapons and long-range missiles once inspections end.

Ballistic Missile Program: Ambassador Rolf Ekeus, Chairman of UNSCOM and the UN's chief weapons inspector for Iraq, believes most, if not all, of the 819 Scud missiles Iraq received from the former Soviet Union have been accounted for. Other information suggests, however, that Baghdad has not accounted for all of its Scud missiles and that perhaps several dozen missiles remain hidden in Iraq.

Nuclear Weapons Program: Nuclear weapons production is likely to take the longest time. Baghdad still has the technical expertise, but much of the infrastructure needed to produce fissile materials must be rebuilt. If Saddam were to attempt to move as rapidly as possible, he would need only a few years to do so.

Chemical Weapons Program: The coalition severely damaged the chemical weapons infrastructure as well, and it too will have to be rebuilt. Much of the hard-to-get production equipment was removed and hidden before the bombing started, however, and would be available for reconstruction. If UN sanctions were relaxed, Iraq could produce some chemical agents almost immediately. It would take a year or more to recover the CW capability it previously achieved.

Biological Weapons Program: Facilities belonging to the BW program also were damaged, but critical equipment for it, too, was hidden during the war. And because the program does not require a large infrastructure, the Iraqis could be producing BW agents in a matter of weeks.



Biological Weapons: Iraq

- **Iraq had an advanced Biological Weapons Program before the Persian Gulf War.**
- **Large purchases of dual use equipment, vaccines, and toxins were beyond civilian needs**
- **Dual-use nature of biological weapon equipment and techniques makes this the easiest program to hide.**

Iraq will remain a primary proliferation threat at least as long as Saddam remains in power. In addition to what he has hidden, Saddam retains his trained scientists and engineers, and he clearly hopes to outlast the focus of the world's attention.

Annex B

Nuclear Interdiction Chronology

Date (1994)	Reported Incident
14 December	Czech police seized 2.72 kg of material—later identified as 87.7-percent-enriched U-235—in Prague, the largest recorded seizure of such material. Police arrested a Czech nuclear physicist and two citizens of the former Soviet Union. The uranium apparently came from the FSU and was to be smuggled to Western Europe.
10 December	Press reports indicate Hungarian border guards seized 1.7 kg of uranium and arrested four Slovak citizens. The material (depleted uranium and reactor-grade fuel) reportedly was concealed in a fruit jar and was destined for Austria.
10 November	Press reports indicate Hungarian police discovered 26 kg of radioactive material in the trunk of a car. Three suspects were subsequently arrested.
November	Press reports indicate German police seized 1 mg of cesium-137 in early November and arrested two suspects.
26 October	Press reports indicate Russian authorities arrested three men trying to pass 67 kg of U-238 to unidentified individuals in the city of Pskov.
20 October	Press reports indicate Turkish police arrested an Azeri national trying to sell 750 gm of enriched uranium.
19 October	Press reports indicate Bulgarian officials seized four lead capsules suspected of containing radioactive material. The capsules were found on a bus en route to Turkey, and police detained the two bus drivers.
18 October	Press reports indicate four Indian villagers were arrested attempting to sell 2.5 kg of yellowcake (uranium extracted from ore).
17 October	Press reports indicate Russian authorities seized 27 kg of U-238 and an unknown quantity of U-235, and detained 12 members of a criminal gang.

12 October	Press reports indicate Romanian authorities arrested seven people and seized 7 kg of uranium and an unidentified quantity of strontium or cesium.
5 October	Press reports indicate Romanian police arrested four people trying to sell more than 4 kg of U-235 and U-238.
30 September	Press reports indicate that a container with radioactive substances was found on a street in Tallinn, Estonia.
30 September	Press reports indicate Slovak officials arrested four Slovaks trying to smuggle almost 1 kg of U-235 (judged not to be weapons-grade) into Hungary.
26 September	Press reports indicate the discovery of a glass flask containing unspecified "weak radioactive material" at the Wetzlar railroad station in Germany.
14 September	Press reports indicate Bulgarian authorities arrested six Bulgarians and seized 19 containers of radioactive material.
12 September	Press reports indicate German police arrested a Zairian national attempting to smuggle 850 gm of uraninite into Germany.
9 September	Press reports indicate Russian police arrested three people in Glazov trying to sell 100 kg of U-238.
31 August	Press reports indicate thieves broke into a chemical plant in Tambov, Russia, and stole 4.5 gm of cesium 137.
30 August	Press reports indicate Hungarian police arrested two men and seized 4.4 kg of material believed to be fuel rods from a reactor in Russia.
29 August	Press reports indicate Estonian police arrested a man and seized 3 kg of U-238 he had buried under his garage.
24 August	Press reports Russian authorities arrested two men attempting to steal 9.5 kg of U-238 from the Arzamas-16 nuclear weapons research facility.
18 August	Press reports indicate that St. Petersburg police arrested three men trying to sell 60 kg of unidentified nuclear material.

16 August	Press reports indicate German police in Bremen arrested a German who claimed to have 2 gm of plutonium; the sample contained only minute amounts of legally obtainable plutonium.
13 August	Press report indicates that more than 500 gm of nuclear material were seized at Munich airport.
11 August	Press reports indicate a seizure of 0.8 gm of U-235 (enriched to 88%) occurred in Landshut, Germany.
August	Unconfirmed press report says three kg of enriched uranium were seized in southwestern Romania.
30 July	Press reports indicate 56 gm of material, including six gm of plutonium 239, were seized, and Adolf Jaekle, a German citizen, was arrested in Germany in May.
19 July	Press reports indicate Turkish National Police arrested seven Turks and seized 12 kg of weapons-grade uranium.
8 July	Russian authorities arrest three officers from the Northern Fleet accused of having stolen 4.5 kg of U-238 from their base in November 1993.
6 July	Russian authorities in Shezninks discover 5.5 kg of U-238 previously stolen from the Chelyabinsk-65 nuclear facility.
6 June	Russian security official announces the arrest of three Russians in St. Petersburg who allegedly tried to sell 3.5 kg of highly enriched uranium.

Senate Permanent Subcommittee on Investigations

EXHIBIT # 3b.

THE CHEMICAL AND BIOLOGICAL WARFARE THREAT

67

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Chemical Warfare: A Tutorial

Introduction

Chemical warfare (CW) can be considered the military use of toxic substances such that the chemical effects of these substances on exposed personnel result in incapacitation or death. It is the impact of chemical effects instead of physical effects (such as blast and heat) that distinguishes chemical weapons from conventional weapons, even though both contain chemicals. In many cases in the Third World, there can be considerable confusion as to what is a chemical weapon and what is not. Some countries consider smoke, flame, incendiary, or riot control weapons to be chemical weapons and label them as such; in addition, conventional weapons can inflict casualties resembling those caused by chemical weapons.

Generally speaking, a chemical weapon is comprised of two main parts: the agent and a means to deliver it. Optimally, the delivery system disseminates the agent—most often a liquid—as a cloud of fine droplets, known as an aerosol. This permits the highly toxic agents to cover a relatively broad amount of territory evenly and efficiently.

Chemical warfare, as we know it, began in 1915 when Germany disseminated large clouds of chlorine, a choking agent, on French troops. Allied forces eventually responded in kind, resulting in continuous escalation by both sides until the end of the war. By the time the Armistice was signed in November 1918, well over 1 million soldiers and civilians had been injured by chemical weapons and nearly 100,000 had died. Chemical weapons continued to be used sporadically after World War I—including Italian use in Ethiopia in 1937 and Egyptian use in Yemen during the mid-1960s—but large-scale use of chemical weapons did not resume until Iraq began using them against Iran in 1983. It was this use that underscored the threat of CW proliferation among Third World countries and highlighted the need to control the spread of chemical weapons.

CW Agents

Chemical warfare agents can be classified on the basis of a number of physical and chemical properties. These properties, which underlie the advantages and disadvantages of each agent, are summarized below.

Lethality is a way of classifying CW agents to be either lethal or nonlethal, but there is not always a clear distinction. Lethal agents are designed primarily to cause fatalities under battlefield conditions, although sublethal doses will cause incapacitation. Nonlethal agents are designed primarily to incapacitate or injure but can kill in large enough doses.

Mode of action indicates by which of several routes CW agents and other toxic chemicals affect living organisms. From a CW standpoint, the most useful routes of exposure are passive ones, such as inhalation and percutaneous means. An agent that acts via inhalation damages the lungs or passes rapidly into the bloodstream when breathed in, while an agent that acts percutaneously damages (or enters the body through) the skin, eyes, or mucous membranes. Less useful on the battlefield but still valid for terrorist purposes are poisons that act orally—by damaging the digestive system or passing into the bloodstream when swallowed—and intravenously, by passing directly into the bloodstream.

Speed of action is a measure of the delay between exposure and effect. Rapid-acting agents can cause symptoms to appear almost instantaneously and might cause fatalities in as little as a few minutes. Slow-acting agents can take days before causing the first symptoms and might take weeks or months before fatalities occur. In general, though, higher doses increase the rate of action.

Toxicity is a measure of the quantity of a substance required to achieve a given effect. CW agents are really just highly toxic compounds that work via inhalation or skin contact. For example, 3,200 milligrams (mg) of the World War I choking agent phosgene per cubic meter of air will kill 50 percent of a test population of humans breathing this mixture. Only 70 mg of the nerve agent sarin—45 times less than phosgene—is required to cause the same fatality rate. The nerve agent VX is even more toxic; just 10 mg on the skin will kill the average adult male. One gallon of VX contains 382,000 such doses. By definition, if the VX is evenly applied at this dosage, 50 percent—or 191,000 people—will die as a result, with the remaining 191,000 becoming seriously ill. This is not really a practical example because, in battlefield use, it is impossible to apply such precise dosages; only a small part of the agent comes into contact with victims. Therefore, such a high casualty rate will never be achieved in practice. However, this example serves to demonstrate how highly toxic some agents really are.

Persistency is a measure of the length of time an agent remains a hazard on the battlefield. Nonpersistent agents tend to be rather volatile and evaporate quickly; these dissipate within a few minutes to about one hour. Semipersistent agents generally linger for several hours to one day. Persistent agents, which tend to be rather thick and oily, can last for several days to a few weeks. Agents can also be "thickened" to increase persistency by adding one of a variety of viscous materials. The mixing of thickeners with soman, for example, will increase the persistency of soman. However, the actual length of time an agent remains a hazard varies widely according to the environment (soil, vegetation, and so forth) and meteorological conditions (temperature, wind speed, atmospheric stability, moisture, sunlight). Just as a puddle of water evaporates more quickly on a hot, sunny, breezy July afternoon than on a cool, foggy, calm December morning, CW agents will dissipate more rapidly when exposed to high temperatures and wind speeds and an unstable atmosphere.

State refers to the physical form of the agent. CW agents can be any of the three basic states of matter—solid, liquid, or gas—but most are liquids. Thus, the terms "nerve gas," "mustard gas," and "poison gas" are misnomers. These misnomers stem from the dissemination of liquid agents as aerosol or vapor clouds, which act like gases.

CW Agents and Field Employment

In general, the amount of CW agent delivered determines the extent of contamination and the number of casualties. A rough rule of thumb is that 1 ton (or about four 55-gallon drums) of agent is enough to effectively contaminate 1 square mile of territory if properly disseminated. The number of resultant casualties depends on the number of people in the contaminated area, length of warning, and degree of protection, as well as the persistency and lethality of the agent used. The persistency of a specific agent (length of time it remains effective) varies depending on the type of munition used and the weather conditions. In all cases, given sublethal doses of an agent, incapacitation will occur to varying degrees.

First-Generation Agents

Choking agents are the oldest CW agents. This class of agents includes *chlorine* and *phosgene*, both of which were used in World War I. In sufficient concentrations, their corrosive effect on the respiratory system results in pulmonary edema, filling the lungs with fluid and choking the victim. Phosgene is more effective than chlorine because it is slowly hydrolyzed by the water in the lining of the lungs, forming hydrochloric acid, which rapidly destroys the tissue.

These agents are heavy gases that remain near ground level and tend to fill depressions such as foxholes and trenches. Because they are gases, they are nonpersistent and dissipate rapidly in a breeze. As a result, these are among the least effective traditional CW agents. They are useful for creating a short-term respiratory hazard on terrain that is to be quickly occupied.

Blood agents are absorbed into the body primarily by breathing. They prevent the normal utilization of oxygen by the cells and cause rapid damage to body tissues. Blood agents such as *hydrogen cyanide (AC)* and *cyanogen chloride (CK)* are highly volatile and in the gaseous state dissipate rapidly in air. Because of their high volatility, these agents are most effective when surprise can be achieved against troops who do not have masks or who are poorly trained in mask discipline. In addition, blood agents are ideally suited for use on terrain that the user hopes to occupy within a short time. Blood agents rapidly degrade a mask filter's effectiveness. Therefore, these agents could also be used to defeat a mask's protective capabilities when combined with other agents.

Blister (vesicant) agents are primarily used to cause medical casualties. These agents may also be used to restrict use of terrain, to slow movements, and to hamper use of materiel and installations. Blister agents affect the eyes and lungs and blister the skin. *Sulfur mustard, nitrogen mustard,* and *lewisite* are examples of blister agents. Most blister agents are insidious in action; there is little or no pain at the time of exposure except with lewisite, which causes immediate pain on contact.

Sulfur mustard is considered by some to be the ideal CW agent. It presents both a respiratory and a percutaneous hazard, forcing military personnel to don not only gas masks but also cumbersome protective overgarments—seriously degrading their ability to function. Mustard is persistent and presents a long-term hazard, further hindering victims by forcing them to decontaminate. Being based on old technology, it is simple to produce, even by Third World standards. Moreover, it causes large numbers of long-term, debilitating injuries, whose treatment can easily overburden an enemy's war effort.

From a CW perspective, an advantage of mustard over lewisite is that the latter hydrolyzes very rapidly upon exposure to atmospheric moisture to form a nonvolatile solid. This conversion lowers the vapor hazard from contaminated terrain and decreases the penetration of the agent through clothing. Lewisite is less persistent than mustard; however, the persistency of both is limited under humid conditions.

Second-Generation Agents

G-series nerve agents, including *tabun (GA), sarin (GB), soman (GD),* and *GF,* are members of a class of compounds that are more lethal and quicker acting than mustard. They are organophosphorus compounds that inhibit action of the enzyme acetylcholinesterase. These agents are similar to many pesticides and, in fact, were accidentally discovered in the 1930s by German chemists seeking new types of pesticides.

G-series agents act rapidly (within seconds of exposure) and may be absorbed through the skin or the respiratory tract. However, some of these agents, particularly GA and GB, tend to be relatively nonpersistent and consequently present less of a skin hazard than a vapor hazard. In sufficient concentration, the ultimate effect of these agents is paralysis of the respiratory musculature and subsequent death. Exposure to a lethal dose may cause death in as little as several minutes. These less persistent agents are used to cause immediate casualties and to create a short-term respiratory hazard on the battlefield. Persistent G-series nerve agents such as GS and GF would present more of a skin hazard.

Third-Generation Agents

V-series nerve agents, including *VE, VG, VM, VS,* and *VX,* are compounds similar to, but more advanced than, G-series nerve agents. Developed in the 1950s by the British, these agents tend to be more toxic and more persistent than G-agents. They present a greater skin hazard and are used to create long-term contamination of territory.

Nonlethal Agents

Tear gas agents fall under the broader category of riot control agents. They are not considered by the US Government to be CW agents because they are nonlethal in all but the highest concentrations.

Examples of this type of agent include *orthochlorobenzylidene malononitrile (CS), chloroacetophenone (CN), chloropicrin (PS),* and *bromobenzyl cyanide (BBC).* These agents are highly irritating, particularly to the eyes and respiratory tract, and cause extreme discomfort. Symptoms occur almost immediately upon exposure and generally disappear shortly after exposure ceases.

In military situations, tear gas agents are used to temporarily reduce the effectiveness of enemy personnel. In tactical operations, they can be used to penetrate fortified positions and flush out the enemy. Also, these agents are useful for disrupting "human wave" assaults by breaking up formations and destroying the momentum of the attack. Because tear gas agents are nonlethal, they can be used near friendly troops without risking casualties; thus, their use is more flexible than with conventional CW agents.

Vomiting agents are often considered to be riot control agents because, under field conditions, they cause great discomfort but rarely serious injury or death. Characteristic agents include *adamsite (DM)* and *diphenyl chloroarsine (DA).* In addition to causing vomiting, these arsenic-based agents may also irritate the eyes and respiratory system.

The action of vomiting agents may make it impossible to put on, or continue wearing, a protective mask. Therefore, in military situations, vomiting agents may be used in conjunction with lethal CW agents to increase casualties. They may also be used by themselves in proximity to friendly troops and in other situations well-suited for tear gas agents.

Psychochemicals, also considered incapacitants, include hallucinogenic compounds such as *lysergic acid diethylamide (LSD), 3-quinuclidinyl benzilate (BZ),* and *benactyzine.* These agents alter the nervous system, thereby causing visual and aural hallucinations, a sense of unreality, and changes in the thought processes and behavior. Psychochemicals are generally characterized by a slightly delayed onset of symptoms and by persistence of symptoms for a period greatly exceeding exposure time.

The advantage of psychochemicals is their ability to inactivate both civilian and military personnel for a relatively short period with essentially no fatalities. Thus, their use may prove advantageous in areas with friendly populations. One drawback, however, is that the effects of many of these agents are unpredictable.

Chemical Weapons

There are many different ways to disseminate CW agents. Most common are the free-flight munitions that are fired at or dropped on a target. These can be weaponized in unitary or binary form, and the larger munitions can contain submunitions. It is also possible to disseminate agent from a spray tank attached to an aircraft or from a ground-based aerosol generator.

Most conventional munitions can be modified to deliver lethal or nonlethal chemical agents. Typical chemical munitions include:

- Aerial bombs.
- Artillery rockets.
- Artillery shells.
- Grenades.
- Mines.
- Missile warheads.
- Mortar rounds.

These normally contain burster charges surrounded by bulk-fill agent. The burster ruptures the munition and causes the agent to be disseminated as a stream or cloud of small droplets.

Air- or ground-based aerosol generators can be used for more controlled dissemination of CW agents. A spray tank can be used to disseminate agents from aircraft, just as crop dusters are used to spread insecticides. Similarly, the same type of ground-based aerosol generators used to disseminate pesticides can be used for CW purposes. One drawback of these systems, however, is limited survivability during wartime.

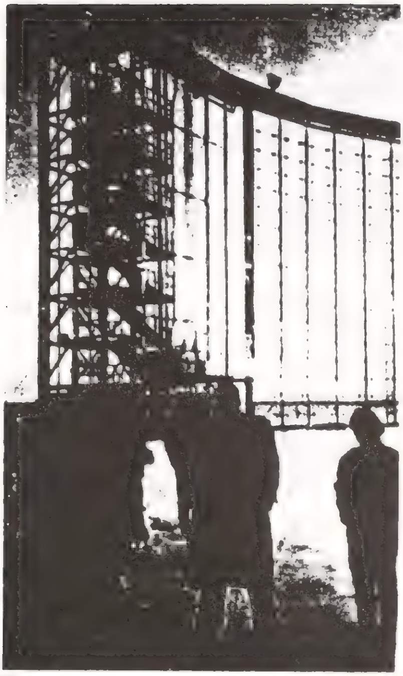

Figure 1. Example of a vertical aerosol test grid for open-air exposure

Chemical munitions usually fall into one of two categories: unitary or binary. A unitary munition contains the agent itself, while binary munitions contain two agent precursors that mix in the munition and form agent before or during flight. Unitaries are able to deliver more agent per munition, but binaries—because they contain the less toxic precursors—are safer.

CW agents can also be carried in submunitions or bomblets. The submunitions are ejected from the primary munition some distance above the ground. They land on the ground in a random pattern and detonate, covering an area larger and more evenly than with a bulk-fill munition.

Optimum fuzing can vary depending on the agent. Impact fuzing, employed in ground-burst munitions, is best used in conjunction with volatile, nonpersistent agents, which generally will dissipate if disseminated at too great an altitude. Proximity fuzing—whether based on lasers, radar, barometric pressure, or timers—is best used in conjunction with persistent agents, which can be disseminated at higher altitudes and still reach the target.

Production of CW Agents

Many CW agents, particularly the first-generation agents, are simple to produce. They are often based on technology that is at least 80 years old and sometimes older, putting them well within the reach of virtually any Third World country that wants them. Newer agents, particularly the nerve agents, are more difficult to produce; however, the technology for these agents is widely available in the public domain.

In many ways, production of CW agents is like that of legitimate commercial compounds. Both involve use of standard chemical process equipment, including reactor vessels, in which production actually occurs; distillation columns and filters, where compounds are separated or purified; heat exchangers, to control temperature; and various pumps, pipes, valves, and other items that control the movement of chemicals throughout the plant. The greatest similarities occur between pesticide and nerve agent production units because these compounds are so closely related.

There are some pieces of equipment, such as those controlled by the Australia Group (see inset), that are distinct enough to warrant special consideration.[1] In particular, equipment that is exceptionally

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[1] For a detailed listing of this equipment, please see table 3, General Guidelines for Identifying Dual-Use Chemical Equipment and Related Technology.

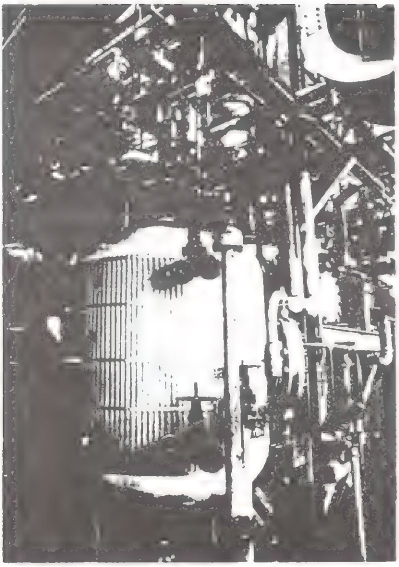

Figure 2. Chemical reactor

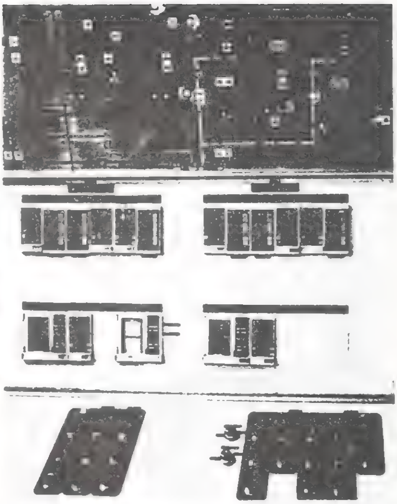

Figure 3. Process control equipment

resistant to corrosion—such as Hastelloy and other high-nickel alloys—has important applications in CW because of the highly corrosive compounds encountered in CW agent production. Also worthy of suspicion are double-seal pumps and other equipment designed to handle exceptionally toxic compounds.

CW Defense

There are four primary aspects of CW defense:

Protection. Potential victims need to prevent CW agents from coming into contact with the body. This is accomplished by surrounding the body with a physical barrier consisting of a gas mask, to filter air; a protective overgarment, boots, and gloves to keep agents away from the skin; and, sometimes, collective protective systems to do both. Masks usually are fitted with canisters filled with activated charcoal, which filters out CW agents as air is drawn through. Gloves and boots are almost always made of butyl rubber or a similar impermeable material that is resistant to CW agents. Some overgarments, such as those in the former Soviet Bloc countries, are impermeable as well. In contrast, Western overgarments are usually made of layers of activated charcoal sandwiched between two pieces of semipermeable fabric; these allow for ventilation.

Detection. Adequate detection is needed to ensure that troops take adequate protective measures in time. Detectors range from electronic standoff instruments to treated paper. The time needed to detect CW agents can vary considerably.

Australia Group

*The **Australia Group** is an informal organization, currently consisting of 25 nations, committed to ensuring that exports of materials and equipment from their countries do not contribute to the spread of chemical or biological weapons. The group, formed in 1984, meets biannually to:*

- *Discuss and agree on measures to control the export of CBW-relevant material and equipment.*
- *Consider effective means of implementing and enforcing export controls.*
- *Exchange information on CBW proliferation.*
- *Discuss provisions to control activities that could contribute to CBW proliferation.*
- *Expand membership in the AG to other select nations and to encourage all countries to adopt export controls on relevant materials comparable to those adopted by the AG.*

To date, Australia Group members have adopted export controls or agreed to institute controls on the following:

- *Fifty-four chemical warfare agent precursor chemicals.*
- *Dual-use processing equipment that is applicable to the manufacture of CW agents and precursor chemicals.*
- *Human, animal, and plant pathogens and toxins with potential BW applications.*
- *Dual-use biological equipment, suitable for development, production, or dissemination of BW agents.*

The embargoes on CBW-relevant material and equipment have impeded but not stopped CBW weapons proliferation. However, by continuing to focus on export controls, the Australia Group will remain a viable force in curtailing the spread of CBW weapons and will play a complimentary role to the Chemical and Biological Weapons Conventions' (CWC and BWC) goals of completely eliminating these weapons from world arsenals.

Decontamination. If equipment and personnel are exposed to a persistent agent, decontamination is needed to eliminate the hazard. Decontamination generally involves using a water-based caustic or bleach material to neutralize any agent present. Sodium hydroxide and sodium hypochlorite are two common constituents of decontaminant solutions.

Treatment. If a victim is exposed to agent, prompt medical treatment is needed to counteract the agent and limit injuries. For example, atropine is the standard antidote for nerve agent poisoning. This compound is injected into the bloodstream and often is followed by a cholinesterase reactivator, such as pralidoxime chloride (or 2-PAM chloride). In addition, pretreatments, such as pyridostigmine, can be used before an attack to limit nerve-agent-related damage.

One important factor to consider is the degradation in performance caused by CW defense. Troops wearing protective overgarments function much less effectively than troops without, leading to a reduction in the effective strength of a military unit. Thus, a military advantage can be achieved merely by threatening to use chemical weapons. In addition, the need to decontaminate—such as the presence of a persistent agent—even further reduces fighting ability.

Table 1
Chemical Warfare Agents

Agent Class	Agent	Symbol	Persistency	Rate of Action
Nerve	Tabun	GA	Low	Very rapid
	Sarin	GB	Low	Very rapid
	Soman	GD	Moderate	Very rapid
	GF	GF	Moderate	Very rapid
	VX	VX	Very high	Rapid
Blister	Sulfur mustard	H,HD	Very high	Delayed
	Nitrogen mustard	HN-1	High	Delayed
		HN-2	Moderate	Delayed
		HN-3	Very high	Delayed
	Phosgene oxime	CX	Low	Immediate
	Lewisite	L	High	Rapid
	Phenyldichloroarsine	PD	Low-moderate	Rapid
	Ethyldichloroarsine	ED	Moderate	Delayed
	Methyldichloroarsine	MD	Low	Rapid
Choking	Phosgene	CG	Low	Delayed
	Diphosgene	DP	Low	Variable
Blood	Hydrogen cyanide	AC	Low	Rapid
	Cyanogen chloride	CK	Low	Rapid
	Arsine	SA	Low	Delayed
Riot control (vomiting)	Diphenylchloroarsine	DA	Low	Rapid
	Diphenylcyanoarsine	DC	Low	Rapid
	Adamsite	DM	Low	Rapid
Riot control (tear gas)	Chloroacetophenone	CN	Low	Immediate
	Chloropicrin	PS	Low-high	Immediate
	Bromobenzylcyanide	CA	Moderate-very high	Immediate
	O-chlorobenzylidene malononitrile	CS	Low-high	Immediate
Psycho-chemicals	3-Quinuclidinyl benzilate	BZ	High	Delayed

Table 2
CW Agent Precursor Chemicals–Uses and CW Agent Equivalents

Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor[1]
1 Thiodiglycol 111-48-8	Organic synthesis	Sulfur mustard (HD)	1.3
	Carrier for dyes in textile industry		
	Lubricant additives	Sesqui mustard (Q)	1.79
	Manufacturing plastics		
2. Phosphorus oxychloride 10025-87-3	Organic synthesis	Tabun (GA)	1.05
	Plasticizers		
	Gasoline additives		
	Hydraulic fluids		
	Insecticides		
	Dopant for semiconductors grade silicon		
	Flame retardants		
3. Dimethyl methylphosphonate (DMMP) 756-79-6	Flame retardants	Sarin (GB)	1.12
		Soman (GD)	
		GF	1.45
4. Methylphosphonyl difluoride 676-99-3	Organic synthesis	Sarin (GB)	1.40
	Specific uses not identified	Soman (GD)	1.82
		GF	1.80
5. Methylphosphonyl dichloride 676-97-1	Organic synthesis	Sarin (GB)	1.05
	Specific uses not identified	Soman (GD)	1.36
		GF	1.35
6. Dimethylphosphite 868-85-9	Organic synthesis	Sarin	1.27
	Lubricant additive	Soman	1.65
		GF	1.65

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[1] (Figures in parentheses are based on the use of PCl_3 as a chlorine donator in the reaction.)

Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor
7. Phosphorus trichloride 7719-12-2	Organic synthesis	VG	1.95
	Insecticides	Tabun (GA)	1.18
	Gasoline additives	Sarin (GB) Salt process	1.02 (0.34)
	Plasticizers	Rearrangement process	1.02 (0.68)
	Surfactants	Soman (GD) Salt process	1.32 (0.44)
	Dyestuffs	Rearrangement process	1.32 (0.88)
		GF Salt process	1.31 (0.44)
		Rearrangement process	1.31 (0.87)
8. Trimethyl phosphite 121.45-9	Organic synthesis	Used to make dimethylmethylphosphonate (DMMP)-molecular rearrangement.	See #3
9. Thionyl chloride[2]. 7719-09-7	Organic synthesis	Sarin (GB)	1.18
		Soman (GD)	1.53
		GF	1.51
		Sulfur mustard (HD)	1.34
	Chlorinating agent	Sesqui mustard (Q)	1.84
	Catalyst	Nitrogen mustard (HN-1)	0.714
	Pesticides	Nitrogen mustard (HN-2)	0.655
	Engineering plastics	Nitrogen mustard (HN-3)	1.145
10. 3-Hydroxy-1-methylpiperidine 3554-74-3	Specific uses not identified. Probably used in pharmaceutical industry.	Non-identified. Could probably be used in the synthesis of psychoactive compounds such as BZ.	
11. N,N-diisopropyl-(beta)-aminoethyl chloride 96-79-7	Organic synthesis	VX	1.64
		VS	1.72

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[2] (Thionyl chloride could serve as chlorinating agent in all of these processes-other chlorinating agents could be substituted.)

Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor
12. N,N-diisopropyl-aminoethanethiol 5842-07-9	Organic synthesis	VX	1.66
		VS	1.75
13. 3-Quinuclidinol 1619-34-7	Hypotensive agent	BZ	2.65
	Probably used in synthesis of pharmaceuticals		
14. Potassium fluoride 7789-23-3	Fluorination of organic compounds	Sarin (GB)	2.41
	Cleaning and disinfecting brewery, dairy and other food processing equipment.	Soman (GD)	3.14
	Glass and porcelain manufacturing	GF	3.10
15. 2-Chloroethanol 107-07-3	Organic synthesis	Sulfur mustard (HD)	0.99
	Manufacturing of ethylene-oxide and ethylene-glycol	Sesqui mustard	0.99
		Nitrogen mustard (HN-1)	1.06
	Insecticides		
	Solvent		
16. Dimethylamine 124-40-3	Organic synthesis	Tabun (GA)	3.61
	Pharmaceuticals		
	Detergents		
	Pesticides		
	Gasoline additive		
	Missile fuels		
	Vulcanization of rubber		
17. Diethyl ethylphosphonate 78-38-6	Heavy metal extraction	Ethyl sarin (GE)	0.93
	Gasoline additive		
	Antifoam agent		
	Plasticizer		

Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor
18. Diethyl N,N-dimethyl phosphoramidate 2404-03-7	Organic synthesis	Tabun (GA)	0.90
	Specific uses not identified		
19. Diethylphosphite 762-04-9	Organic synthesis	VG	Catalyst
	Paint solvent	Sarin (GB)	1.02
	Lubricant additive	Soman (GD)	1.32
		GF	1.30
20. Dimethylamine HCl 506-59-2	Organic synthesis	Tabun (GA)	1.99
	Pharmaceuticals		
	Surfactants		
	Pesticides		
	Gasoline additives		
21. Ethylphosphonous dichloride 1498-40-4	Organic synthesis	VE	1.93
	Specific uses not identified but could be used in manufacturing of flame retardants, gas additives, pesticides, surfactants, etc.	VS	2.14
		Ethyl sarin (GE)	1.18
22. Ethylphosphonyl dichloride 1066-50-8	Organic synthesis	Ethyl sarin (GE)	2.10
	Specific uses not identified. See #21.		
23. Ethylphosphonyl difluoride 753-98-0	Organic synthesis	Ethyl sarin (GE)	2.70
	Specific uses not identified. See #21.		
24. Hydrogen fluoride 7664-39-3	Fluorinating agent in chemical reactions	Sarin (GB)	7.0
	Catalyst in alkylation and polymerization reactions	Soman (GD)	9.11
	Additives to liquid rocket fuels	Ethyl sarin (GE)	7.7
	Uranium refining	GF	9.01
25. Methyl benzilate 76-89-1	Organic synthesis	BZ	1.39
	Tranquilizers		

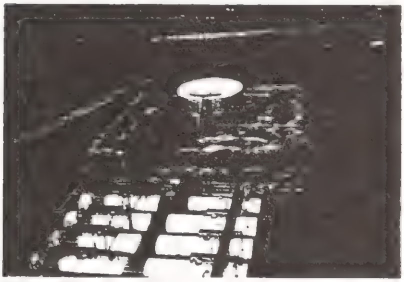
Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor
26. Methylphosphonous dichloride 676-83-5	Organic synthesis	VX	2.28
27. N,N-diisopropyl-(beta)-aminoethanol 96-80-0	Organic synthesis Specific uses not identified	VX	1.84
28. Pinacolyl alcohol 464-07-3	Specific uses not identified	Soman (GD)	1.79
29. O-ethyl,2-diisopropyl aminoethyl methyl-phosphonate (QL) 57856-11-8	Specific uses not identified	VX	1.14
30. Triethyl phosphite 122-52-1	Organic synthesis	VG	1.62
	Plasticizers		
	Lubricant additives		
31. Arsenic trichloride 7784-34-1	Organic synthesis	Arsine	0.43
	Pharmaceuticals	Lewisite	1.14
	Insecticides		
	Ceramics	Adamsite (DM)	1.53
		Diphenylchloroarsine (DA)	1.45
32. Benzilic acid 76-93-7	Organic synthesis	BZ	1.48
33. Diethyl methylphosphonite 15715-41-0	Organic synthesis	VX	1.97
34. Dimethyl ethylphosphonate 6163-75-3	Organic synthesis	Ethyl sarin (GE)	1.12
35. Ethylphosphonous difluoride 430-78-4	Organic synthesis	VE	2.58
		Ethyl sarin (GE)	1.57
36. Methylphosphonous difluoride 753-59-3	Organic synthesis	VX	3.18
		VM	2.84
		Sarin (GB)	1.67
		Soman (GD)	2.17
		GF	2.15

Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor
37. 3-Quinuclidone 1619-34-7	Same as #13 3-quinuclidinol	BZ	2.65
38. Phosphorous pentachloride 10026-13-8	Organic synthesis	Tabun (GA)	0.78
	Pesticides		
	Plastics		
39. Pinacolone 75-97-8	Specific uses not identified	Soman (GD)	1.82
40. Potassium cyanide 151-50-8	Extraction of gold and silver from ores	Tabun (GA)	1.25
	Pesticide		
	Fumigant	Hydrogen cyanide	0.41
	Electroplating		
41. Potassium bifluoride 7789-29-9	Fluorine production	Sarin (GB)	1.79
	Catalyst in alkylation	Soman (GD)	2.33
	Treatment of coal to reduce slag formation	GF	2.31
	Fluid in silver solder		
42. Ammonium bifluoride 1341-49-7	Ceramics	Sarin (GB)	2.46
	Disinfectant for food equipment	Soman (GD)	3.20
	Electroplating	GF	3.16
	Etching glass		
43. Sodium fluoride 7681-49-4	Pesticide	Sarin (GB)	3.33
	Disinfectant	Soman (GD)	4.34
	Dental prophylaxis	GF	4.29
	Glass and steel manufacturing		
44. Sodium bifluoride 1333-83-1	Antiseptic	Sarin (GB)	2.26
	Neutralizer in laundry operations	Soman (GD)	2.94
	Tin plate production	GF	2.91

Precursor Chemical	Civil Uses	CW Agent Production	Units of Agent per Unit of Precursor
45. Sodium cyanide 143-33-9	Extraction of gold and silver from ores	Tabun (GA)	1.65
	Fumigant	Hydrogen cyanide	0.55
	Manufacturing dyes and pigments	Cyanogen chloride	1.25
	Core hardening of metals		
	Nylon production		
46. Triethanolamine 102-71-6	Organic synthesis	Nitrogen mustard (HN-3)	1.37
	Detergents		
	Cosmetics		
	Corrosion inhibitor		
	Plasticizer		
	Rubber accelerator		
47. Phosphorus pentasulfide 1314-80-3	Organic synthesis	VG	1.21
	Insecticide	VX	1.20
	Mitocides		
	Lubricant oil additives		
	Pyrotechnics		
48. Diisopropylamine 108-18-9	Organic synthesis	VX	3.65
	Specific uses not identified		
49. Diethylaminoethanol 100-37-8	Organic synthesis	VG	2.30
	Anti-corrosion compositions	VM	2.05
	Pharmaceuticals		
	Textile softeners		
50. Sodium sulfide 1313-82-2	Paper manufacturing	Sulfur mustard (HD)	2.04
	Rubber manufacturing		
	Metal refining		
	Dye manufacturing		

Precursor Chemical	Civil Uses Production	CW Agent Unit of Precursor	Units of Agent per
51. Sulfur monochloride sulfur chloride 10025-67-9	Organic synthesis Pharmaceuticals Sulfur dyes Insecticides Rubber vulcanization Polymerization catalyst Hardening of soft woods Extraction of gold from ores	Sulfur mustard (HD)	1.18
52. Sulfur dichloride 10545-99-0	Organic synthesis Rubber vulcanizing Insecticides Vulcanizing oils Chlorinating agent	Sulfur mustard (HD)	1.54
53. Triethanolamine hydrochloride	Organic synthesis Insecticides Surface active agents Waxes, polishes Textile specialties Lubricants Toiletries Cement additive Petroleum demulsifier Synthetic resin	Nitrogen mustard (HN-3)	1.10
54. N,N-diisopropyl-2-aminoethyl chloride hydrochloride	Organic synthesis	VX	1.34

Table 3
General Guidelines for Identifying Dual-Use Chemical Equipment and Related Technology



Storage tanks

I. Manufacturing Facilities and Equipment

1. **Reactor Vessels and Agitators** (with total volume greater than 100 liters and less than 20,000 liters)

2. **Storage Tanks, Containers, and Receivers** (with total volume greater than 100 liters)

3. **Heat Exchangers or Condensers**

4. **Distillation or Absorption Columns**

5. **Valves and Multi-Walled Piping** (multiple-seal valves, bellows-seal valves, diaphragm valves, and multi-walled piping incorporating a leak detection port)

6. **Pumps** (multiple-seal, canned-drive, magnetic drive, bellows or diaphragm pumps having a flow rate greater than 0.6 cubic meter per hour; or vacuum pumps with a flow rate greater than 5 cubic meters per hour)

Materials of construction for all surfaces of the foregoing equipment in direct contact with the chemicals being processed:

(a) Nickel or alloys with more than 40 percent nickel by weight.

(b) Alloys with more than 25 percent nickel and 20 percent chromium by weight.

(c) Fluoropolymers.

(d) Glass or glass-lined.

(e) Tantalum, titanium, zirconium, or their alloys.

(f) Graphite (for heat exchangers, pumps, and multi-walled piping only).

(g) Ceramics or ferrosilicon (for pumps only).

7. **Filling Equipment** (remotely operated)

Materials of construction for all surfaces of the foregoing equipment in direct contact with the chemicals being processed:

(a) Nickel or alloys with more than 40 percent nickel by weight.

(b) Alloys with more than 25 percent nickel and 20 percent chromium by weight.

8. **Incinerators** (with an average combustion chamber temperature greater than 1000°C)

Materials of construction for all surfaces of the foregoing equipment in direct contact with the chemicals being processed:

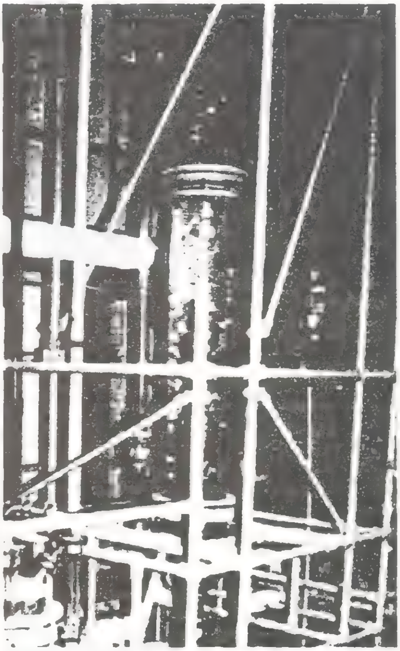
(a) Nickel or alloys with more than 40 percent nickel by weight.

(b) Alloys with more than 25 percent nickel and 20 percent chromium by weight.

(c) Ceramics.

Table 3 (continued)

Piping



Distillation column

Table 3 (continued)

9. Whole plants

II. Toxic Gas Monitoring Systems

1. Detectors

Toxic gas monitoring systems:

(a) Designed for continuous operation and capable of detecting chemical warfare agents and designated chemical warfare agent precursors as well as organic compounds containing phosphorus, sulfur, fluorine, chlorine at a concentration less than 0.3 milligram per cubic meter of air.

(b) Capable of detecting cholinesterase-inhibiting activity.

III. Related Technology

Technology, including licenses, directly associated with the manufacture of chemical weapons agents, their precursors, or dual-use equipment for such manufacture.

Table 4
Availability Review for Key Dual-Use Chemical Production Equipment

Item 1. Chemical process equipment constructed of Hastelloy, Monel, or another alloy with a nickel content in excess of 40 percent by weight, as follows: reactor vessels, storage tanks, and containers, heat exchangers, distillation columns, degassers, or condensers.

The chemical process equipment specified in this item is available from many countries in Europe, Asia, Latin America, Eastern Europe, and the independent republics of the former Soviet Union. These specifications encompass equipment suitable for treating certain common industrial wastes, sewage and potable water, as well as producing chemical and biological warfare agents. Following is a list of countries believed to have production capabilities for such chemical process equipment. In addition to the countries identified below, a scrap market exists from which a potential purchaser may obtain equipment.

The countries listed below are believed to be capable of manufacturing the chemical process equipment described.

Reactor Vessels
United Kingdom, France, Germany, Switzerland, Hungary, China, Japan, India, Brazil, Korea, and Italy (also see Item 3 for glass-lined reactors).

Storage Tanks and Containers
Japan, Sweden, Korea, Germany, Taiwan, South Africa, Mexico, countries of former Yugoslavia, Czechoslovakia, France, and Russia and the other newly independent states.

Heat Exchangers
France, United Kingdom, China, Russia and the other newly independent states, Germany, Japan, and Singapore.

Distillation Columns
France, United Kingdom, China, Russia and the other newly independent states, Germany, and Japan.

Heat exchanger

Condensers
These are available from manufacturers worldwide, including Third World countries.

Item 2. Thermometers or other sensors encased in alloy with a nickel content in excess of 40 percent.

Thermometers or other sensors are available worldwide and, for this purpose, can be placed in a thermal well or encased as the end user specifies.

Item 3. Chemical process equipment listed in Item 1, which is *lined* with nickel, polyvinylidene fluoride, high-density polyethylene, or glass.

Chemical processing equipment with corrosion-resistant linings is also available worldwide. The principal manufacturers for nickel-lined, polyvinylidene fluoride-lined, and high-density polyethylene-lined equipment are in Western Europe and Japan.

Table 4 (continued)

For glass-lined equipment, the principal manufacturers are in Western and Eastern Europe, Japan, and South America, although China also possesses the capability to manufacture glass-lined equipment. The uses for this equipment range from the treatment of potable water, sewage, or industrial wastes to production of chemical and biological warfare agents.

Countries capable of manufacturing equipment lined with materials other than glass are identified below. For glass-lined equipment, specific companies are identified.

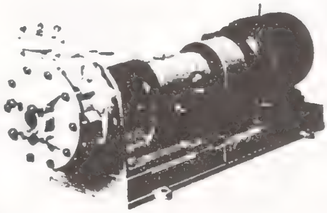
Lined With Nickel, Polyvinylidene Fluoride, and High-Density Polyethylene
Japan, Germany, and Switzerland.

Glass-Lined Reactors
United Kingdom—Canon (subsidiary of GEC); Pfaudler Balfou; **France**—DeDetrich; **Germany**—Pfaudler Werke AG; Thalle (former GDR); **Switzerland**—Estella; **Hungary**—Lampart; **Japan**—Shinko Pan Tac; Hako Sanyo; **India**—GMN Pfaudler; **Brazil**—Pfaudler S.A.; **Italy**—Tycon and Technoglass.

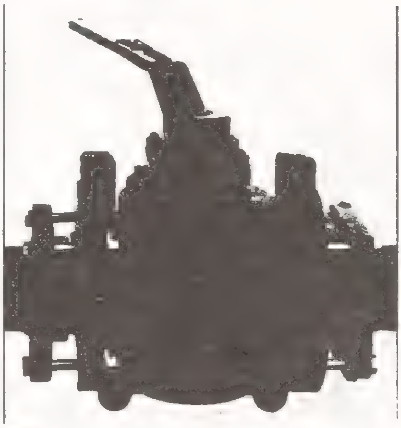
China and South Korea are capable of producing this glass-lined equipment.

Item 4. Pumps and valves (a) incorporating a body made from alloy with a nickel content in excess of 40 percent by weight, or (b) lined with nickel, or (c) otherwise designed to be utilized with fluorine or hydrogen fluorine, or organophosphorus compounds. (Note: includes double-seal, electromagnetic drive, or canned pumps; bellows or diaphragm valves meeting this specification.)

Based on a review of the manufacturers' buyer catalogs, pumps incorporating a body made from alloy with a nickel content in excess of 40 percent by weight are available from sources in Japan, Israel, and North Korea. Such pumps are also available from sources in Brazil, France, India, Israel, Taiwan, South Korea, South Africa, China, and Russia and the other newly independent states.



Pump



Valve

Table 4 (continued)

Valves, similarly made from nickel alloy, are also available from manufacturers in France, Israel, and Korea. Below is a list of manufacturers identified for pumps and valves.

Pumps

Japan—Ebara, Teikoku, Nikkiso, Sanwa, Seikow Chemical, Iwaki, Kira, N.G.K.; **Israel**—Meltzer and Sons Ltd., Hameitz Pump MFG. Ltd.; **South Korea**—Korea Chemical Engineering Co., Ltd.

Valves
France—Gachot S.A.; **Israel**—Ham-Let Metal Products, Kim Production Ltd., EZM-MP Lachis Zafor; **South Korea**—Foxboro Korea, Ltd.

Item 5. Filling equipment enclosed in a glove box or similar environmental barrier, or incorporating a nickel-lined or Hastelloy nozzle.

Filling equipment, as described in this item, is available from manufacturers within AG and the non-AG countries of China, Taiwan, and Russia and the other newly independent states. The manufacture of Hastelloy nozzles is probably limited to Germany and Italy, although nickel-lined nozzles are available and in abundant supply on a worldwide basis. The following are known manufacturers of Hastelloy nozzles:

Germany—Sprint Metal Edelstahlziehereien, Lechler, HP + HP, and Chemie-Stellglieder; **Italy**—Cucchi Pompe and PNRI.

Item 6. Incinerators specially designed to incinerate (a) any chemical weapons agent or listed precursor; or (b) organophosphorus compounds.

Incinerators described in this item are available from AG and non-AG countries. Six countries with 13 manufacturers of this equipment are identified below, although Russia may also possess the capability to manufacture such incinerators.

Australia—Dorr-Oliver; **Finland**—Alsthom, Otokupo, and Tampella; **Germany**—Deutsche Babcock, Von Roll, Dorr-Oliver, and Lurgi; **Japan**—IHI; **Sweden**—Asea Brown Boveri (ABB), Gotaverken, and Niro; **Switzerland**—Thyssen.

Item 7. Toxic gas monitoring systems designed to detect phosphorus, sulfur, or fluorine compounds, or designed to detect any CW agent, which are (a) designed for continuous operation, *and* (b) capable of detecting such chemicals at a concentration less than 0.1 milligram per cubic meter of air.

Toxic gas monitoring systems, as described in this item, are available from the United Kingdom and Russia and the independent republics of the former Soviet Union. The United Kingdom is considered a world leader in the manufacture of detection systems for hazardous gases. The former USSR reportedly had developed a semiautomatic gas analyzer capable of detecting toxic gas concentrations at a level of 0.05 milligram per cubic meter of air. The manufacturers for this type of equipment are:

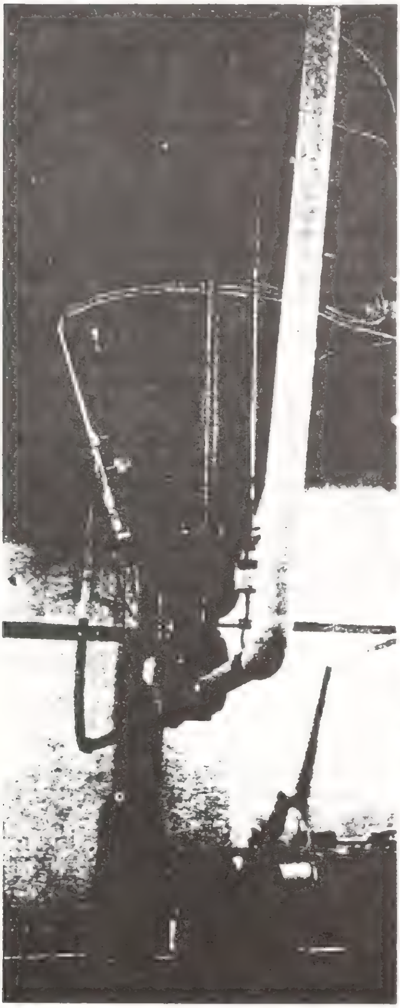
United Kingdom—SKC, Bruel & Kjaer, Neotronics, and Crowcon Instruments Ltd.; **Russia and the other newly independent states**—Odessa State University.

Item 8. Monitoring systems for detection of chemical compounds having anticholinesterase activity.

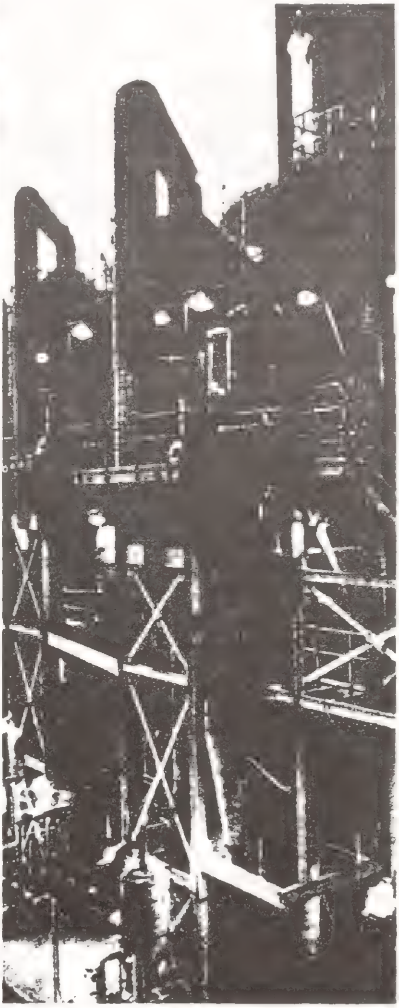
The availability of monitoring systems capable of detecting anticholinesterase activity is widespread, with developments in Sweden, Finland, Russia and the other newly independent states, and the former Yugoslavia. A 1989 study indicated that the newly independent states' armed forces employed the PKHR-MV analyzer during field training exercises. Manufacturers of this item are:

Former Yugoslavia—VTI facility; **Sweden**—FFC Ordnance; **Finland**—Instrumentation Oy.

Table 4 (continued)



Dryer



Evaporator

Introduction

Biological warfare (BW) is the use of pathogens or toxins for military purposes. BW agents are inherently more toxic than CW nerve agents on a weight-for-weight basis and can potentially provide broader coverage per pound of payload than CW agents. Moreover, they are potentially more effective because most are naturally occurring pathogens—such as bacteria and viruses—which are self-replicating and have specific physiologically targeted effects, whereas nerve agents are manufactured chemicals that disrupt physiological pathways in a general way.

To a country considering a BW program, one advantage of biological weapons over chemical or nuclear weapons is that there are no reliable BW detection devices currently available nor are there any recognizable signals to the human senses. The delay in onset of symptoms could make it difficult to identify the time and place of the attack. Moreover, a BW attack might be readily attributable to a natural outbreak, providing the attacking country with grounds for plausible denial. In addition, biological weapons can be targeted not only against personnel, but also against crops, domestic livestock, and specific kinds of materiel.

Despite their potentially more devastating effects, biological agents have not been used on any significant scale, possibly for a number of reasons. Perhaps for some countries the principal deterrent to the actual use of BW is uncertainty about ultimate consequences. Biological weapons rarely produce instant casualties, and their effects can be uncertain. The risk, for example, of accidentally exposing friendly forces or civilian populations to BW can be dependent on changing meteorological conditions. International outrage—muted in the Iraqi CW attacks on Iranians and Kurds—could be much more severe if BW weapons, with their devastating effectiveness, result in massive casualties.

Virtually all the equipment, technology, and materials needed for biological agent production are dual use. Therefore, very little distinguishes a vaccine plant from a BW production facility. The technical skills required to start and run a program are commensurate with basic training in microbiology, and additional knowledge can easily be gained through training courses available from equipment suppliers or scientific meetings. Because of the dual-use nature of BW research and equipment, any BW program could be easily disguised as a legitimate enterprise. For example, known BW threat agents include the organisms that cause anthrax, botulism, tularemia, plague, and Q-fever; because these organisms represent a variety of clinical pathogens, extensive legitimate research is continually under way to eradicate or control them. Medical research or vaccine development, for example, requires production of such organisms on scales varying from laboratory to pilot and industrial levels.

BW Agents

Agents that have been widely recognized as having military utility include pathogens—such as bacteria, viruses, and fungi—as well as toxins. For BW purposes, these agents are incorporated into a munition or some type of dissemination system. The material delivered in the weapon is customarily defined as the BW agent.

Pathogens, defined as organisms that cause disease in man, may be grown and exploited for military purposes, as is the case for the bacterial agents that produce anthrax, plague, tularemia, and Q-fever. Other known BW threat agents include viruses—submicroscopic infective agents composed of DNA or RNA that require living cells to replicate. As BW agents, these organisms can produce a wide range of results, with varying degrees of toxicity and time of onset. The route of entry—percutaneous, ingestion, inhalation, parenteral—impacts dramatically on the effective dosage of both BW and CW agents. (For a listing of organisms that could potentially be exploited for BW applications, please see tables 5 through 8.)

Alternatively, organisms can be grown to produce toxins that are exploited in weapons, as, for example, *Clostridium botulinum,* a toxin-producing organism that is the causative agent of botulism. Toxins are poisonous compounds produced by living organisms. They are usually proteins that act upon specific receptors in the body. Most are relatively unstable to heat and other traumatic and environmental factors, although some can be separated into smaller fragments that are more stable while retaining toxicity. Toxins can be either lethal or highly incapacitating, with some having potentially greater toxicity than well-known CW agents. Toxins are produced by a variety of organisms, including microbes, snakes, insects, spiders, sea creatures, and plants.

One example of a plant toxin is ricin, which is derived from the castor bean. The use of this toxin against two Bulgarian defectors in 1978 in an "umbrella gun" underscores another application of BW agents: clandestine or terrorist use. Other examples of toxins having potential application as BW threat agents include tricothecene mycotoxins—derived from fungi—and algal toxins. Algal toxins are suited for BW purposes because of their high toxicity, the lack of vaccines and medical treatment, and the lack of detection systems deployed against them. For example, saxitoxin, produced by marine algae, acts on the nerve cells and ultimately causes respiratory arrest.

A theoretical possibility that should not be discounted for BW threat purposes is exploitation of bioregulators—organic chemicals that regulate cell processes—and physiologically active compounds such as catalysts and enzymes. Bioregulators are natural substances produced in very small quantities that are essential for normal physiological functioning of the body. They control cell and body physiological functions and regulate a broad range of functions, such as bronchoconstriction, vasodilation, muscle contraction, blood pressure, heart rate, temperature, and immune responses. These substances can be harmful, however, in large concentrations or if modifications to them bring about changes in the nature and duration of their action. Exploited in such a way for military purposes, they could potentially cause such effects as rapid unconsciousness, heart failure, paralysis, hypotension or hypertension, or psychological disturbances.

Through advanced biotechnical techniques, toxins, bioregulators, and infectious agents are subject to enhancement to increase their utility as BW agents. For example, potential types of genetically engineered disease-causing agents might include antibiotic-resistant bacteria; benign microorganisms genetically altered to produce toxins, venoms, or bioregulators; immunologically altered viruses resistant to standard vaccines and not identifiable by classical serological means; bacteria genetically altered to have advanced aerosol and environmental durability.

Production Processes and Equipment

No specialized facilities are required for the production of BW agents, since their production involves dual-use equipment and technologies such as those associated with, for example, a legitimate vaccine or pharmaceutical plant. For biological products, there are three general levels of production—***laboratory scale, pilot scale,*** and ***industrial scale.*** There are no clear demarkations of the vessel sizes for these scales, but they are

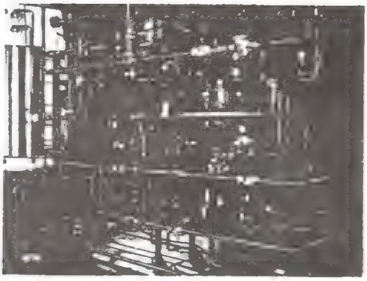


Figure 4. Research-size fermenter

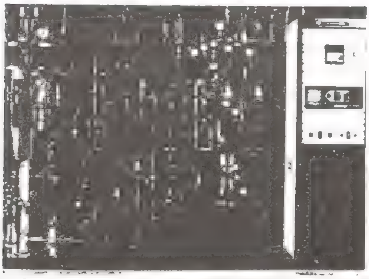


Figure 5. Pilot-scale fermenter

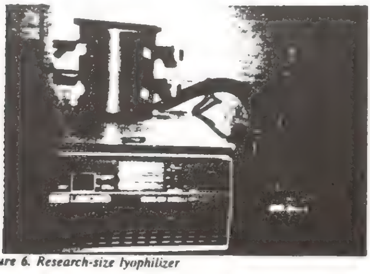


Figure 6. Research-size lyophilizer

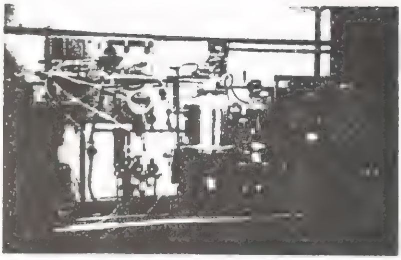


Figure 7. Continuous-flow centrifuge

Figure 8. HEPA filter

Figure 9. "Space suits" for use in BL-4 suite

generally listed as less than 50 liters, 50 to 500 liters, and over 500 liters, respectively.

The particular scale of choice depends on the use of the end product. In commercial endeavors such as recombinant insulin production, pilot scale adequately produces enough material, while the production of antibiotics requires much larger industrial-scale volumes. For military applications, pilot scale operations could produce strategically significant quantities of agents, but even laboratory scale operations could, in time, produce enough material for military needs. Genetic engineering offers a great potential for more efficient production of BW agents—especially for those toxin agents that naturally occur in very small quantities. For example, the insertion of DNA that codes for a toxin into a ubiquitous, nonpathogenic organism allows production of significant quantities of that toxin in pilot-scale equipment.

Laboratory scale production is usually limited to research or "bench top" work. It is difficult to distinguish between legitimate commercial and offensive BW research activities because the laboratory equipment is generally the same for both or can be rapidly switched. All of the equipment used to research, develop, and produce BW agents is essential for safe and efficient handling of deadly organisms in legitimate biological research. Thus, standard biological laboratory equipment, such as fermenters, large-scale lyophilizers or freeze dryers, class II or III safety hoods, High-Efficiency Particulate Air (HEPA) filters, and centrifuges, could easily be subverted to a weapons program. International attempts are under way to control the sale of this equipment to proliferating countries, although the dual-use nature of the equipment is an inherent problem in identifying BW-related exports.

For research on highly pathogenic organisms, high-containment or maximum-containment facilities and equipment are generally utilized. The designations P-1/BL-1 through P-4/BL-4 refer to (P)rotection or (B)iocontainment (L)evel, with level 4 being the highest level of protection or containment. Basically, these level designations represent the number of physical barriers that prevent an organism from escaping to the outside from the laboratory work space. By international agreement, P-4/BL-4 is required for work on dangerous agents that pose a high risk of life-threatening diseases. High-containment laboratories (P-4/BL-4) are costly and difficult to maintain; there are only a handful of them around the world, with the majority conducting legitimate research on highly contagious diseases. It should be noted, however, that it is not necessary to have a high-containment facility for work on BW agents. For example, research of botulinum toxin and anthrax requires only a recommended P-2/BL-2 level of containment. If safety is not a concern to a country, most organisms can be researched at the lowest containment level available.

Industrial operations require both pilot- and industrial-scale equipment in order to allow the scaleup of research efforts. In general the types of equipment are very similar to those used in laboratories, except with increased capacities. Industrial-scale equipment usually has capacities of tens of thousands of liters but may be up to several hundred thousand liters. The limits are usually set by the support apparatus and the availability of raw materials, such as media, and spare parts, such as O-rings and gaskets.

There is no equipment unique to BW agent production, although the Australia Group has defined equipment parameters that would be of particular utility for BW purposes (see table 9). In the typical biological production process, an organism is grown in a fermenter in a type of media favorable to the organism's growth. While some organisms require very specific nutrients, most can be grown in generic media. Where whole cellular organisms are the desired end product, the cells are subsequently separated from the media in a centrifugal separator and converted to an appropriate form for storage. For botulinum toxin, however, the end product is the toxin that is normally secreted into the media; in this case the cells are separated from the extracellular fluid in a centrifuge and eliminated; the liquids containing the toxin are then purified. Other organisms secrete toxins within the

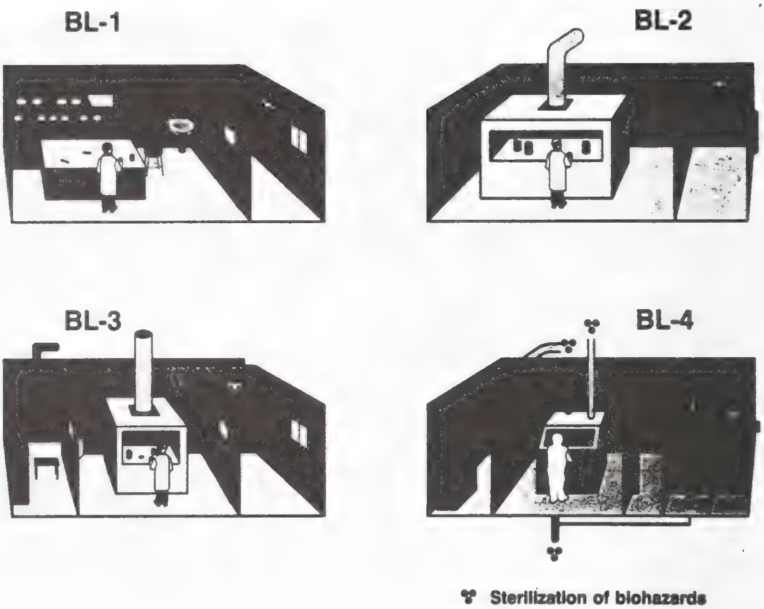


Figure 10. Biocontainment levels

cells; for isolation of these endotoxins, some form of cell wall disruption is necessary before the end product can be isolated.

The type of fermentation process depends upon the type of end product desired. The most widely used approaches include discontinuous ("batch"), anaerobic ("feed batch"), and continuous fermentation. There is extensive overlap of the volumes among these different processes.

Only recently has the technology existed to produce militarily significant quantities of BW agents. Now, virtually any known disease-causing agent can be manufactured in the laboratory, and many can be produced on an industrial scale. With genetic engineering, new possibilities have emerged, which could allow for the design of new pathogens, more virulent strains of organisms, or organisms with characteristics tailored to specific military requirements. With biotechnology and genetic engineering advances since the 1970s, it is now possible theoretically to mass-produce lethal natural products previously available only in small, militarily insignificant quantities. With recombinant DNA technology, for example, it is possible to produce new organisms, exploit variations on organisms, or induce organisms to respond in new ways, such as producing synthetic bioregulators or chemical toxins.

The Variety and Specifics of Fermentation Processes

In the discontinuous or "batch" process a single batch of nutrients is added to the fermenter. The microorganisms are then inoculated into the nutrient substrate in a process known as charging or seeding. The microorganisms are allowed to grow until the substrate has been exhausted, typically requiring as little as two days. The fermenter volume is commonly larger than that of the other processes in order to more economically exploit the nutrients. Anaerobic or "feed batch" fermentation is carried out in a batch mode in the absence of oxygen. Fresh nutrient is added periodically during production to increase product yields. Usually the product is harvested intermittently. Clostridium botulinum, *source of botulinum toxin, and* Bacillus anthracis, *positive causative organism of anthrax, are organisms grown under anaerobic fermentation conditions.*

In continuous fermentation, cells typically are kept in a state of rapid growth as the secreted end products are produced. Additional nutrients are fed into the fermenter at the same rate as the end products are removed so that conditions remain nearly constant. This process increases the overall yield because end product is produced throughout the fermentation process. A significant concern, however, in long-term continuous fermentation is possible contamination by undesirable organisms. This risk is minimized by carefully monitoring the output and terminating the process if contamination is detected.

There are numerous types of fermentation vessels available. A standard, general purpose fermenter consists of a cylindrical metal vessel (usually stainless steel) with a 2:1 height-to-diameter ratio and either a cone-shaped or a sloping bottom to facilitate emptying. The fermenter also has a number of ports for adding nutrients, removing content samples, and inserting control probes. Larger fermenters have integrated steam systems for cleaning and sterilization. The tank may be fitted with openings for venting or collecting waste gases. Most are equipped for agitation by baffle plates fitted inside the fermentation tank and an intermeshing motor-driven impeller. The general types of fermenters include stirred tanks, airlift, chemostatic, cell, immobilized cell (or enzyme), hollow-fiber, and heavy-ton.

The stirred tank and heavy-ton vessels have all the features described above. The heavy-ton, however, are much larger and are commonly used commercially for Single Cell Protein (SCP) production—a microbial-based product used for animal feeds. These systems are well suited for most BW agent production. Airlift systems use bubbling air from the bottom of the vessel to stir the broth instead of an agitator. These systems would be well suited for fragile organisms but could not be used in anaerobic fermentation. Chemostatic fermenters are designed to facilitate the continuous fermentation process. The cell, immobilized cell, and hollow-fiber fermenters are designed to provide a small growth surface for the cells by physically separating the cells from the growth media while allowing diffusion of nutrients and end products through membranes. These three allow greater and more efficient yields and are more commonly used with animal cell systems that have greater growth regulation requirements than bacterial cells.

Procurement Issues

International attempts to stem BW proliferation have focused either on suppliers (as the Australia Group is doing) or on self-disclosures and declarations (under the Biological and Toxin Weapons Convention of 1972). However, supplier responsibilities can be clouded by the dual-use nature of the equipment, and BW developers could claim legitimate defensive research activities or attribute production accidents to naturally occurring epidemics.

Both the materials and the technical skills needed to start up a modest offensive BW program are easily attainable and relatively cheap. In general, most organisms needed for a potential offensive BW program are readily available through commercial repositories that isolate, preserve, and dis-

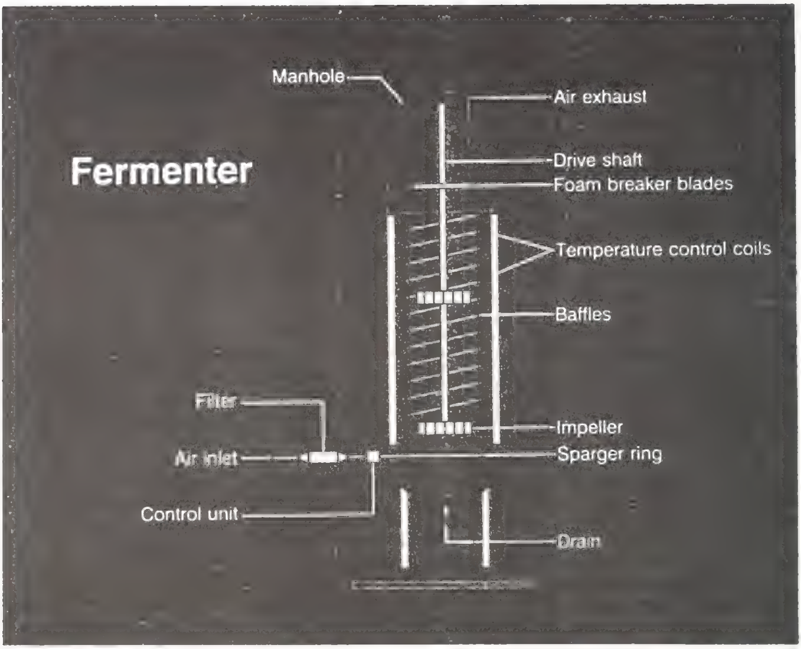


Figure 11. Fermenter

tribute cultures. Such repositories can supply thousands of differing bacterial cultures, frozen or freeze-dried, including classical BW agents such as anthrax and *Clostridium botulinum.* An anthrax culture costs approximately $45 from a US repository. The current requirement is a signed form accepting responsibility for the receipt and attesting to the existence of adequate facilities and practices to work with potentially highly pathogenic materials. Until very recently, no other verifications were necessary to receive such pathogens. The United States initiated the requirement for end-user certificates on certain pathogenic organisms, but even this measure can be circumvented by otherwise legitimate companies acting on the behalf of BW programs. Starting cultures could also be traded, stolen, or obtained gratis from other research, clinical, or veterinary laboratories or scientists. And finally, any organism may be isolated from the environment.

The equipment and materials needed to produce BW agents, likewise, are easily obtained or can be adapted from readily available items. Virtually any type flask or useful container can be sterilized in an everyday pressure cooker and used to grow the organism. A 20-liter fermenter combined with a filling port can be obtained from a home brewing supplier for under $50. These suppliers can also be a source of larger capacity fermenters. Although there are specialized complex media for some of the agents used in BW programs, most agents can be grown in readily available materials. This material may be as simple as augmented animal feeds or easily available milk products. (See table 10 for a list of bioprocessing equipment suppliers.)

Finally, it should be noted that advances in biotechnology have eliminated the need for a stockpile of BW agents. Proliferating nations only need a starter culture of agent; they can then wait until they wish to use biological weapons to produce the quantities required. In contrast to a CW program, for example, there is no need in BW efforts for a continuing supply of sizable quantities of precursor chemicals and raw materials.

The following attached tables are provided for reference purposes, as an aid in determining the potential applicability of materials and equipment to biological agent production. A list of producers of equipment with such potential applications is included as table 10.

Table 5
Biological Warfare Agents: Examples

Disease	Causative Agent	Incubation time (*days*)	Fatalities (*percent*)
Anthrax	*Bacillus anthracis*	1-5	80
Plague	*Yersinia Pestis*	1-3	90
Tularemia	*Francisella tularensis*	1-10	5-20
Cholera	*Vibrio cholerae*	2-5	25-50
Venezuelan equine encephalitis	VEE virus	2-5	< 1
Q fever	*Coxiella burnetti*	12-21	< 1
Botulism	*Clostridium botulinum* toxin	3	30
Staphylococcal enterotoxemia (food poisoning)	*Staphylococcus enterotoxin* type B	1-6	< 1
Multiple organ toxicity	Trichothecene mycotoxin	Dose dependent	

Table 6
Core List of Organisms Having Potential BW Applications

Viruses
Chikungunya virus
Congo-Crimean haemorrhagic fever virus
Dengue fever virus
Eastern equine encephalitis virus
Ebola virus
Hantaan virus
Junin virus
Lassa fever virus
Lymphocytic choriomeningitis virus
Machupo virus
Marburg virus
Monkey pox virus
Rift Valley fever virus
Tick-borne encephalitis virus (Russian Spring-Summer encephalitis virus)
Variola virus
Venequelan equine encephalitis virus
White pox
Yellow fever virus
Japanese encephalitis virus

Rickettsiae
Coxiella burnetii
Rickettsia quintana
Rickettsia prowasecki
Rickettsia rickettsii

Bacteria
Bacillus anthracis
Brucella abortus
Brucella melitensis
Brucella suis
Chlamydia psittaci
Clostridium botulinum
Francisella tularensis
Pseudomonas mallei
Pseudomonas pseudomallei
Salmonella typhi
Shigella dysenteriae
Vibrio cholerae
Yersinia Pestis

Genetically Modified Microorganisms Which
(a) Contain nucleic acid sequences associated with pathogenicity and are derived from organisms in the core list.
(b) Contain nucleic acid sequences coding for any of the toxins in the core list.

Toxins
Botulinum toxins
Clostridium perfringens toxins
Conotoxin
Ricin
Saxitoxin
Shiga toxin
Staphylococcus aureus toxins
Tetrodotoxin
Verotoxin
Microcystin (Cyanginosin)

Table 7
Animal Pathogens With Potential BW Applications

African swine fever virus
Avian influenza virus (only those of high pathogenicity)
Bluetongue virus
Foot and mouth disease virus
Goat pox virus
Herpes virus (Aujeszky's disease)
Hog cholera virus
Lyssa virus
Newcastle disease virus
Peste des petits ruminants virus
Porcine enterovirus type-9
Rinderpest virus
Sheep pox virus
Teschen disease virus
Vesicular stomatitis virus

Bacteria
Mycoplasma mycoides

Genetically Modified Microorganisms
Genetically modified microorganisms or genetic elements that contain nucleic acid sequences associated with pathogenicity and are derived from organisms in the core list.

Table 8
Warning List

Viruses
Kyasanur Forest virus
Louping ill virus
Murray Valley encephalitis virus
Omsk haemorrhagic fever virus
Oropouche virus
Powassan virus
Rocio virus
St. Louis encephalitis virus

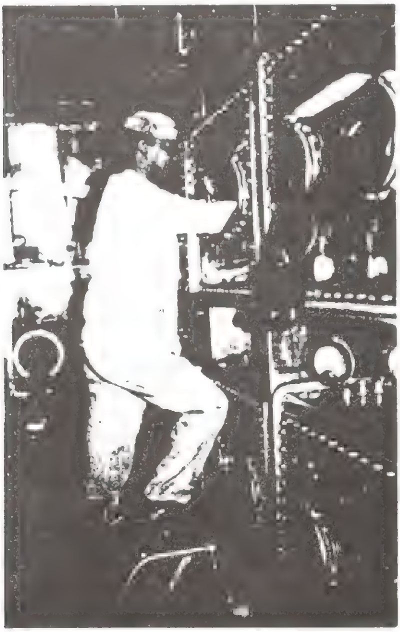
Bacteria
Clostridium perfringens
Clostridium tetani
Enterohaemorrhagic Escherichia coli serotype 0157 and other verotoxin producing serotypes
Legionella pneumophila
Yersinia pseudotuberculosis

Genetically Modified Microorganisms Which
Genetically modified microorganisms or genetic elements that contain nucleic acid sequences associated with pathogenicity and are derived from organisms in the warning list.

Genetically modified microorganisms or genetic elements that contain nucleic acid sequences coding for any of the toxins in the warning list.

Toxins
Abrin
Cholera toxin
Tetanus toxin
Trichothecene mycotoxins

Table 9
General Guidelines for Identifying Dual-Use Biological Equipment and Related Technology



Class III animal housing

Double-walled aerosol chamber

1. Complete Containment Facilities at P3/BL3, P4/BL4 Containment Level

Complete containment facilities that meet the criteria for P3 or P4 (BL3, BL4, L3, L4) containment (as specified in the WHO Laboratory Biosafety Manual).

2. Fermenters

(a) Capacity equal to or greater than (300) liters (L).

(b) Made of polished stainless steel, borosilicate glass, polished aluminum (or plastic/other non-corrodible material).

Table 9 (continued)

(c) Double or multiple sealing joints within the steam containment area.

(d) Capable of in situ sterilization in a closed state.

3. Centrifugal Separators

(a) Flow rate greater than 100 liters per hour.

(b) Components of polished stainless steel or titanium.

(c) Double or multiple sealing joints within the steam containment area.

(d) Capable of in situ steam sterilization in a closed state.

4. Freeze Drying Equipment

Steam sterilizable freeze drying equipment with a condensor capacity greater than 50 kgs of ice in 24 hours and less than 1,000 kgs of ice in 24 hours.

5. Cross-Flow Filtration Equipment

Cross-flow filtration equipment designed for continuous separation of pathogenic microorganisms, viruses, toxins, and cell cultures without the propagation of aerosols, having all the following characteristics:

(a) Equal to or greater than 5 square meters.

(b) Capable of in situ sterilization.

6. Equipment That Incorporates or Is Contained in P3 or P4 Containment Housing, Specifically

(a) Independently ventilated protective full or half suits.

(b) Class III safety cabinets or isolators with similar performance standards.

7. Aerosol Inhalation Chambers

Chambers designed for aerosol challenge testing with pathogenic microorganisms, viruses, or toxins and having a capacity of 1 cubic meter or greater.

Other equipment:

1. Equipment for the microencapsulation of live microorganisms and toxins in the range of 1 to 10 meters particle size, specifically:

(a) Interfacial polycondensors.

(b) Phase separators.

2. Fermenters of less than 300-liter capacity with special emphasis on aggregate orders or designs for use in combined systems.

3. Conventional or turbulent air-flow clean-air rooms and self-contained fan-HEPA filter units that may be used for P3 or P4 (BL3, BL4, L3, L4) containment facilities.

Table 10
Availability Review of Key Dual-Use Bioprocessing Equipment

1. Worldwide manufacturers of fermenters

Confirmed Sources (manufacturers capable of producing fermenters of 100 liters or greater):

Australia Group	Manufacturer
Australia	B Braun Australia Pty. Ltd.
	Sulzer Australia Pty. Ltd.
Austria	Andritz Maschinenfabrik AG
Belgium	Sulzer Belgium SA/NV
Canada	Pegasus Industrial Specialties, Ltd.
	Sulzer Canada, Inc.
	WHE Process Systems, Ltd.
Denmark	Alfa-Laval AS
France	Chemap (made in Switzerland)
	Inceltech
	LSL Biolafitte SA
	SGI Setric Genie Industriel
Germany	Alfa-Laval Industrie GmbH
	B Braun Diessel Biotech GmbH
	Chemap GmbH (made in Switzerland)
	New Brunswick Scientific GmbH (made in US)
	Sulzer-Escher Wyss GmbH
Hungary	Vegyepszer
Italy	Alfa-Laval SpA
	B Braun Milano SpA (made in Germany)
Japan	B Braun Biotech Co., Ltd. (made in Germany and Malaysia)
	Marubishi Bioengineering Co., Ltd.
	Mitsuwa Rikagaku Kogyo Co., Ltd.
Netherlands	Applikon Dependable Instruments BV
	Sulzer Nederland BV
Sweden	Chemoferm AB
	Electrolux Fermentation
Switzerland	Bioengineering AG
	Chemap AG
	LSL Secfroid SA
	MBR Bio Reactor AG
United Kingdom	B Braun Medical, Ltd.
	Bioengineering UK, Ltd.
	Centech, Ltd.
	FT Applikon, Ltd.
United Kingdom (continued)	LH Fermentation, Ltd.
	Life Sciences Laboratories, Ltd.
	MBR Bio Reactor (UK), Ltd.
	Sulzer (UK), Ltd.

Non-Australia Group	Manufacturer
Brazil	Sulzer do Brasil SA Industria e Comercio
Bulgaria	Scientific Research Lab for Instrument Making and the Automation of Biological Experiments
Czech Republic and Slovakia	Kralovopolska Stroyirna
Russia and the other newly independent republics	All-Union Scientific Research Design Institute of Applied Biochemistry
	Institute of the Biochemistry and Physiology of Microorganisms
	Irkutsk Scientific Research Institute of Chemical Machines
	NPO Biopribor
	NPO Biotekhnika
	Special Design Bureau for Biological Instruments
South Korea	Korean Fermentor Co.

Unconfirmed Sources:

Australia Group	Manufacturer
Australia	Bulkon Australia Pty. Ltd.
	Cawthron Institute
Austria	Arge Biotechnologie
	Raiffeisen-Bioforschung
	Vogelbusch
Belgium	Belgolab SA
	Biotim N.V.
	Elscolab NV
	Holurieka NV
	Microgon, Inc.
Canada	Mueller Canada, Inc.
	The SNC Group
	St. Lawrence Reactors, Ltd.
	Techneurop, Inc.
	Wardrop Engineering, Inc.

Table 10 (continued)

Finland	G. W. Berg & Co., AB
	Rintekno OY
France	Bertin & Cie
	Bignier Schmid Laurent
	Biolog
	BSL Industries SA
	CCM
	Cellier SA
	Flobio
	Goavec
	Interscience
	Lequeux
	Pharmacia LKB Instruments SA
	Sonertec
Germany	Aluminiumgiesserei Neukoelin Oskar
	Waltersdorf GmbH
	Atlantik Geraetebau GmbH
	Bioinvest Engineering
	Buero Biotechnik
	Deutsche Metrohm GmbH & Co.
	Diessel GmbH & Co.
	Fr Kammerer GmbH
	Friedrich & Hofmann
	Heinrich Frings GmbH
	Holag Technologie AG
	Holurieka GmbH
	IBL GmbH
	IMA GmbH
	Kalger GmbH
	KC Biological
	Kraftanlangen Heidelberg AG
	Lang Labortechnik
	Membran-Tecknik-Hamburg
	PRG Praaezisions-Ruehrer GmbH
	Schuett Labortechnik GmbH
	Siemens AG
	Then Maschinen un Apparatebau GmbH
	VEB Chemieanlagenbaukombinat
Hungary	Mafki Ungar. Erdoel-und Erdgas Forschunginstitut
	Magyar Tudomanyos Akademia
Ireland	P J Brennan & Co., Ltd.
Italy	A Biotec
	Olsa SpA
	Oxytek SAS
	Vismara Associates SpA
Japan	Fuji Electric Co.
	Hirayama Manufacturing Corp.
	Hitachi, Ltd.
	Idemitsu Kosan Co.
	Kawasaki Heavy Industries
	Mitsubishi Heavy Industries
	Nippon Kokaan K.K.
	Nisshin Oil Mills, Ltd.
	Yakult Honsha Co., Ltd.
Netherlands	Amsterdam Valve & Fitting BV
	APV Nederland BV
	Bert Versteeg-Veetech BV
	Contact Flow
	Dalton BV
	Holurieka Holding BV
	Lameris Laboratorium
	Marius Instruments
	Netherlands Institute for Dairy Research
	Pharmacia Nederland BV
	Rhone Poulenc Nederland BV
	Salm & Kipp
	Vogelaar Electronics
Spain	CETS Institut Quimico de Sarria
	Knoik Instruments SA
Sweden	Biolink
	Ninolab AB
Switzerland	Amicon Division
	Arbeitsgemeinschaft Bioenergie
	Lonza, Ltd.
	Rosenmund AG
United Kingdom	Alcon Biotechnology, Ltd.
	Alfa-Laval Engineering, Ltd.
	Anglicon Instruments, Ltd.
	APV Baker
	APV Barnetta Rolfe, Ltd.
	B & P Biotechnology, Ltd.
	BS Flocor, Ltd.
	Catalytic International, Inc.

Table 10 (continued)

United Kingdom (continued)	Charles River UK, Ltd.
	Chemquip, Ltd.
	Dulas Engineering, Ltd.
	ECC International, Ltd.
	Endotronics
	Fairey Engineering, Ltd.
	GB Biotechnology, Ltd.
	Henfrey Engineering
	Hickey & Co., Ltd.
	Imperial Biotechnology, Ltd.
	Life Technologies, Inc.
	Lummus Crest, Ltd.
	MacLeod & Miller (Engineers), Ltd.
	Mass Transfer International
	Matthew Hall Engineering, Ltd.
	National Engineering Laboratory
	NEBC Developments
	Penrhos Electronics
	Pharmacia-LKB Biochrom, Ltd.
	Roth Scientific Co., Ltd.
	Schaefer Instruments, Ltd.
	SGi (UK), Ltd.
	Techmation, Ltd.
	TechnoGen Systems, Ltd.
	Titanium Fabricators, Ltd.

Non-Australia Group	**Manufacturer**
Brazil	Biobas
	Centro de Technologia Promon
	CESHMT Com & Repr, Ltd.*
	Codistil
	Copercucar
	Dedini SA
	Faculdade de Engenharia Industrial
	Setal Instalacoes Industrias SA
	TECHPAR
	Zanini SA Equipmentos
Czech Republic and Slovakia	Kovodruzhstvo
	Microbiology Institute of the Czechoslovakia Academy of Sciences
	Yednotne Zemyedyelske Druzhestvo Rude Armady
China	Beijing Institute of Chemical Metallurgy
	Dalian Institute of Chemical Physics
Russia and the other newly independent republics	All-Union Scientific Research Biotechnology Institute
	Livani Biochemical Plant
	Shebekino Biochemical Plant
South Korea	Doosan Manufacturing Co.
(Former) Yugoslavia	Livani Biochemical Plant
	Shebekino Biochemical Plant

2. Worldwide manufacturers of centrifugal separators

Probable Manufacturers of Centrifugal Separators

Australia Group	**Manufacturer**
Australia	Beckman Instruments Pty, Ltd.
Austria	Heraeus Wien
	Westfalia Separator Austria GmbH
Denmark	6V Separation AS
	Alfa-Laval Separation AS
France	Alfa-Laval SA
	Beckman
	Dupont de Nemours SA
	Jouan SA
Germany	Alfa-Laval Industrietechnik GmbH
	Heraeus-Christ Separationstechnik GmbH
	Heraeus-Sepatech GmbH
	Kontron Instruments GmbH
Italy	Alfa-Laval SpA
	Beckman Analytical SpA
	Dupont de Nemours Italiana SpA
Japan	Alfa Laval K.K.
Netherlands	Labinco BV
	Lameris Laboratorium
Norway	Heigar & Co. AS
	Nyegaard & Co. AS
Sweden	Bergman & Beving AB
Switzerland	Alfa-Laval Industriegesellschaft AG
	Dr. Bender & Dr. Hobein AG
	Heraeus AG
	LSL Secfroid SA
	Treff AG

Table 10 (continued)

United Kingdom	A. R. Horwell, Ltd.
	Alfa-Laval Engineering, Ltd.
	APV Chemical Machinery, Ltd.
	Baird & Tatlock, Ltd.
	Burkard Scientific, Ltd.
	Camlab, Ltd.
	Centrilab
	Damon/IEC, Ltd.
	Denley Instruments, Ltd.
	Dupont (UK), Ltd.
	Eltex of Sweden, Ltd.
	Hawksley & Sons, Ltd.
	Jouan, Ltd.
	MSE
	MSE Scientific Instruments
	Nycomed, Ltd.
	Nygaard (UK), Ltd.
	Sarstedt, Ltd.
	Simsons of Edinburgh, Ltd.
	V. A. Howe & Co., Ltd.
	Zeta Engineering, Ltd.

Other Worldwide Manufacturers of Centrifugal Separators

Australia Group	Manufacturer
Belgium	Sanki Engineering, Ltd.
	Sweco Europe SA
Canada	Sarstedt Canada, Inc.
Finland	Finn Metric OY
France	Guinard Centrifugation
	Kontron
	NEN France Sarl
	Rousselot Ets
Germany	AMKO Light Technology Instruments GmbH
	Andreas Hettich
	Berthold Hermle GmbH
	Carl Padberg Zentrifgenbau GmbH
	Electro-Nucleonics International, Ltd.
	Eppendorf-Netheler-Hinz GmbH
	Hettich-Zentrifugen
	Industrienlagen AG
	Wimmer GmbH
	Zirbus-Verfahrenstechnik
Italy	Hewlett Packard Italian SpA
Japan	Fuji Filter Manufacturing Co., Ltd.
	Hitachi Koki Co., Ltd.
	Mitsubishi Kakoki Kaisha, Ltd.
	Nippon Atomic Industry Group Co.
	Shinmaru Enterprises Corp.
Netherlands	Amsterdam Valve & Fitting BV
	Pijttersen BV
Portugal	Elnor
Spain	Hucoa-Erloss SA

Non-Australia Group	Manufacturer
Malaysia	Juru Rubcoil Sdn Bhd
Russia	Moscow Production Institute of the Food Industry
	All-Union Scientific Research and Experimental Design Institute of the Food Machine Building Industry
South Korea	Han Seong Machinery Manufacturing Co.
	Korea Storage Battery Co.
Taiwan	Bestway Corp.
	Chang Jung Business Company, Ltd.
	Sui Sheng Refrigeration Engineering Co.
	Yau Yuan Industrial Machinery Co.
Ukraine	Kharkov Institute of Mechanization and Electrification of Agriculture

Other Countries

Both Israel and the Republic of South Africa possess the technological know-how, industrial capability, and supporting infrastructure to produce the most advanced centrifuges. India, Brazil, and Pakistan are also potential producers.

3. Worldwide manufacturers of freeze dryers

Confirmed Sources (manufacturers capable of producing units over 1,000 liters per batch capacity):

AG Countries	Manufacturer
Finland	Finn-Acqua Corp. (owned by AMSCO)
France	Cellier
	CIRP/Serail
	Usifroid S. A.
Germany	Leybold-Heraeus GmbH (owned by AMSCO)
United Kingdom	Edwards High Vacuum Intl. (British Oxygen) (owned by AMSCO)

Table 10 (continued)

Non-Australia Group

None identified

Unconfirmed Sources

AG Countries	Manufacturer
Austria	Labin
	Reichert-Jung
Denmark	Atlas (manufactures automated tray loading freeze dryers for the food industry)
France	Biolafitte
	Froilabo Biomedical
	Group S. G. D.
	Heraeus
	Hibbon Intl.
	Rua Instruments
Germany	Alb. Klein GmbH
	Martin Christ GmbH & Co., KG.
	Polimex
Italy	Edvards Alto Vuoto
Japan	Osaka Gas
Netherlands	Grenco BV
Portugal	Cassel Industrias
Spain	Telstar S. A.
Switzerland	Salvis
United Kingdom	Tech

Non-Australia Group	Manufacturer
India	Aircons Pvt., Ltd.
	Coil Company, Ltd.
	Ice-King Refrigeration Engineering
	Ice & Diesel Engineering Works
	Super Refrigeration, Ltd.
Israel	Polipach, Ltd.
Malaysia	Juru Rubcoil Sdn Bhd
Poland	Polimex-Cekop
China	Changchun Pneumatic Components
Singapore	Associated Instrument Mfg. (S), Ltd.
	O.S.L. Sinko
Taiwan	Bestway Corp.
	Chang Jung Business Co., Ltd..
	Fu Sheng Ind Co., Ltd.
	Sui Sheng Refrigeration Eng. Co.
	Yau Yuan Ind Machinery Co., Ltd.
Russia and the other newly independent republics	Institute of the Problems of Cryobiology and Cryomedicine.

4. Aerosol generators specially designed to disseminate live microorganisms or spores

These items may not be commercially available, although aerosol generators commonly used in the agriculture industry to disseminate biological and chemical pesticides may be capable of disseminating BW agents.

5. Equipment for the microencapsulation of live microorganisms

Equipment used for microencapsulation of live microorganisms is available worldwide. Although the process known as coacervation was patented over 30 years ago, certain specialized equipment and technical know-how appear to be the most critical aspects of this item.

6. Biohazard containment equipment, as follows: (a) complete BL-3 or BL-4 level laboratory facilities, (b) equipment or components intended for the construction of such facilities

Equipment as described in this item is available within and outside the AG countries, including sources in China and Taiwan. Foreign manufacturers of this equipment include:

7. Detection or assay systems for biological agents or toxins, capable of detecting concentrations less than one part per million in air

Based on published information, the German multinational firm Draeger Akritngesellschaft appears to be the only manufacturer of this item. Draeger is considered a world leader in the production of sensitive devices for monitoring toxic substances. In addition to its Luebeck-based firm, Draeger has production and distribution facilities located throughout the world, including distribution facilities in Toronto, Canada, and Pittsburgh, Pennsylvania.

8. Complex media for the growth of microorganisms in Class 3 or Class 4, in quantities greater than 100 kilograms, specially brain/heart infusion media

The material described in this item typically consists of a base of soybean milk or dry milk casein powder infused with a broth of the organs from animals. Russia and the other newly independent republics and Cuba possess the technology to commercially produce such media, which is also available from Germany and the United Kingdom.

A Glossary of Terms

Acetylcholinesterase
An enzyme that hydrolyzes the neurotransmitter acetylcholine. The action of this enzyme is inhibited by nerve agents.

Aerosol
A suspension of small, finely divided particles, either liquid or solid, in a gas; for example, fog or smoke.

Antibody
A protein made by vertebrates as the immune response to a foreign macromolecule, or antigen.

Atropine
A compound used as an antidote for nerve agents. It is used medically in its sulfate form to inhibit the actions of acetylcholine in the parasympathetic nervous system.

BL/P levels
There are four biosafety levels (BLs) that conform to specified conditions; these conditions consist of a combination of laboratory practices and techniques, safety equipment, and laboratory facilities appropriate for the operations performed and the hazard posed by the infectious agents. Formerly described as "physical containment (P)" levels.

Binary munition
A chemical munition divided into two sections, each containing precursor chemicals that combine and react during flight, releasing a chemical agent upon impact.

Biological warfare
The use, for military or terrorist purposes, of living organisms or material derived from them, which are intended to cause death or incapacitation in man, animals, or plants.

Bioregulators
Biochemicals that regulate physiological functions and are produced naturally in the body; in inappropriate concentrations, however, they can cause harmful effects.

Biotechnology
Applied biological science; for example, genetic engineering and biofermentation processes.

Blister agent
A chemical agent that can cause blistering of the skin and extreme irritation of the eyes and lungs; although primarily an incapacitant, it can cause death in large doses. Examples are sulfur mustard, nitrogen mustard, and lewisite.

Blood agent
A chemical agent that acts on hemoglobin in blood cells, thus preventing oxygen from reaching cells. Examples are hydrogen cyanide and cyanogen chloride.

Chemical warfare
The military use of toxic substances such that their chemical effects on exposed personnel result in incapacitation or death.

Choking agent
A chemical agent that is typically a nonpersistent, heavy gas. It irritates the eyes and throat and, when inhaled, can lead to pulmonary edema, resulting in death from lack of oxygen. Examples are chlorine and phosgene.

Culture
A population of microorganisms grown in a medium.

Cutaneous
Pertaining to the skin.

DNA
Deoxyribonucleic acid: the genetic material of all organisms and viruses (except for a small class of RNA-containing viruses) that code for structures and materials used in normal metabolism.

Electrophoresis
A technique that separates molecules based on size and/or charge.

Endogenous
Produced or originating from within.

Endotoxin
A toxin produced in an organism and liberated after disruption of the cell wall.

Enterotoxins
Toxins of bacterial origin specific for cells of the intestine.

Enzyme
A protein formed by living cells which acts as a catalyst on physiological chemical processes.

Exogenous
Produced or originating from without.

Exotoxin
A toxin excreted by a microorganism into the surrounding medium.

G-series nerve agents
Chemical agents of moderate to high toxicity developed in the 1930s that act by inhibiting a key nervous system enzyme. Examples are tabun (GA), sarin (GB), soman (GD), and GF.

Genetic engineering
The directed alteration or manipulation of genetic material.

Hemoglobin
The constituent of red blood cells that carries oxygen and gives them their color.

Infectious
Capable of producing disease in a susceptible host.

LD$_{50}$
The dose (LD is lethal dose) that will kill 50 percent of the exposed population.

Medium
A substance used to provide nutrients for the growth and multiplication of microorganisms.

Microorganism
Any organism of microscopic dimensions.

Monoclonal antibody
A single, pure antibody; made from hybridoma cells.

Nerve agent
A chemical agent that acts by disrupting the normal functioning of the nervous system.

Nonlethal agents
Chemical agents that can incapacitate but which, by themselves, are not intended to cause death. Examples are tear gas, vomiting agents, and psychochemicals such as BZ and LSD.

Organophosphorus compound
A compound, containing phosphorus and carbon, whose physiological effects include inhibition of cholinesterase; many pesticides and virtually all nerve agents are organophosphorus compounds.

Pathogen
Any agent capable of producing disease, although usually applied to living agents.

Percutaneous
Through the skin; when applied to chemical agents, refers to route of entry into the body.

Persistence
A measure of the duration for which a chemical agent is effective. This property is relative, however, and varies by agent, by method of dissemination, and by environmental conditions such as weather and terrain.

Precursor	A chemical that can be chemically combined with another substance to form a chemical warfare agent. Most precursors controlled through international efforts have commercial uses as well.
Psychochemical agent	An agent that incapacitates by distorting the perceptions and cognitive processes of the victim.
Pulmonary edema	The excessive accumulation of fluid in lung tissue.
Recombinant DNA (rDNA)	DNA prepared in the laboratory by splitting and splicing DNA from different species, with the resulting recombinant DNA having different properties than the original.
Restriction enzyme	An enzyme that splits DNA at a specific sequence.
Riot control agents	Substances, usually having temporary effects, that are used typically by governmental authorities for law enforcement purposes.
Toxicity	A measure of the harmful effect produced by a given substance on a living organism.
Toxins	Poisonous substances produced by living organisms.
Toxoid	A toxin biologically inactivated by chemical or physical means, usually for vaccine production purposes. Because a prerequisite for toxoid generation is toxin production, the technology involved has applicability to BW.
V-series nerve agents	A class of chemical agents developed in the 1950s that act by inhibiting a key nervous system enzyme. They are generally persistent and have a moderate to high toxicity. Examples are VE, VG, VM, VS, and VX.
Vaccine	A substance administered to induce immunity in the recipient.
Vesicant	A blistering agent.
Virulence	The capacity of a microorganism to produce disease.
Virus	A submicroscopic infectious agent that is characterized by a total dependence on living cells for reproduction and that lacks independent metabolism.
Volatility	A measure of how readily a liquid will vaporize.

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 5a.

STATE OF NEW YORK
DEPARTMENT OF STATE

FILED MAR 10 1993

AMT. OF CHECK $ 70
FILING FEE $ 50
TAX $
COUNTY FEE $
COPY $ 10
CERT $
REFUND $
SPEC HANDLE $ 10
BY:

Type B
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CERTIFICATE OF INCORPORATION

OF

AUM USA COMPANY, LIMITED

Pursuant to Section 402 of
the Not-for-Profit Corporation
Law of the State of New York

FINK, WEINBERGER, FREDMAN,
BERMAN & LOWELL, P.C.

MAR 9 12 PH '93

BILLED

NCR

OK

MAR 10 7 51 AM '93

CERTIFICATE OF INCORPORATION
OF
AUM USA COMPANY, LIMITED

Under Section 402 of the
Not-for-Profit Corporation Law

The undersigned, being at least eighteen (18) years of age, for the purpose of forming a corporation pursuant to the Not-for-Profit Corporation Law of the State of New York, hereby certifies:

FIRST: The name of the corporation shall be "AUM USA COMPANY, LIMITED."

SECOND: The corporation is a corporation as defined in subparagraph (a)(5) of Section 102 of the Not-for-Profit Corporation Law.

THIRD: The purposes for which the corporation is to be formed are as follows:

> The purposes for which the corporation is formed are to foster spiritual development through the study and practice of eastern philosophy and religion; to encourage means for extending awareness, such as meditation, seminars and workshops, to offer nutritional information and exercises which will further the development of spiritual well-being; and to do and perform any and everything which may be necessary, advisable and suitable for the purpose of carrying out the objects

heretofore expressed and to exercise all implied powers and rights, which the corporation may possess; all within the meaning of Section 501(c)(3) of the Internal Revenue Code of 1954, as the same may be amended from time to time, to accept, hold, invest, reinvest and administer any gifts, bequests, devises, benefits of trusts and property of any sort, without limitation as to the amount of value; and to use, disburse, donate and make a gift of the income or principal thereof for charitable purposes and to give, convey or assign any of its property outright, or upon lawful terms regarding the use thereof, to other organizations and private individuals, provided that such other organizations be organized and operated for purposes as set forth within the meaning of Section 501(c)(3) of the Internal Revenue Code of 1954, as the same may be amended from time to time.

To the extent permitted by law, to exercise its rights, powers and privileges, to hold meetings of its Board of Directors, to have one or more offices, and to keep the books of the corporation, in any part of the world.

To acquire, lease, construct, own, operate and maintain any buildings and premises which may be necessary to carry out the purposes hereinabove set forth.

To acquire the assets of other similar not-for-profit corporations, whether by purchase, gift, merger, consolidation or otherwise.

To solicit, accept, receive, hold, borrow, contribute, donate and expend contributions, gifts and grants of every sort for the purposes of the corporation.

To hold, invest, reinvest and administer the corporation's property of every kind and description including but not limited to its funds, and to use, apply, expend, disburse, grant and contribute the same for the purposes of the corporation.

The corporation shall not operate for pecuniary profit or financial gain and no part of the property (including income) of the corporation shall be diverted in any manner directly or indirectly, or otherwise inure to the benefit of any member, trustee, officer of the corporation or any private individuals, except to the extent permitted under the Not-for-Profit Corporation Law.

Along, or in cooperation with other persons or organizations, to do any and all lawful acts and things which may be necessary, useful, suitable or proper for the furtherance, accomplishment or attainment of any or all of the purposes of the corporation.

To perform any acts, including the raising of funds, necessary or incidental to the carrying out of any of the purposes hereinabove set forth. Nothing herein shall authorize the corporation to engage in the practice of the profession of medicine or any other profession required to be licensed by Title VIII of the Education Law. Nothing herein shall authorize the corporation to use the terms psychology, psychological, psychologist or certified social worker in connection with the services of the corporation.

To do any other act or thing incidental to or connected with the foregoing purposes or in advancement thereof, but not for the pecuniary profit or financial gain of its members, directors or officers, nor will any part of the net earnings of the corporation inure to the benefit of or be distributable to its members, trustees, officers or other private persons, except as permitted under Article 5 of the Not-for-Profit Corporation Law.

FOURTH: The corporation is a Type B corporation as defined in Section 201 of the Not-for-Profit Corporation Law.

FIFTH: The principal office of the corporation shall be located in the County of New York, State of New York.

SIXTH: The Secretary of State is hereby designated as agent of the corporation upon whom process against it may be served. The post office address to which the Secretary of State shall mail a copy of any process against the corporation served upon him is: Fumihiro Joyu, 53 Crosby Street, 4th Floor, New York, New York 10012.

SEVENTH: The names and addresses of the persons who shall serve as the initial Directors of the corporation, until the first annual meeting of the Board of Directors are:

Name	Address
Fumihiro Joyu	53 Crosby Street, 4th Floor, New York, New York 10012
Mayumi Yamato	53 Crosby Street, 4th Floor, New York, New York 10012
Yoshitaka Aoki	53 Crosby Street, 4th Floor, New York, New York 10012

EIGHTH: This corporation shall have no members.

IN WITNESS WHEREOF, I have signed my name and affirm that the statements made herein are true under the penalties of perjury, this 8th day of December, 1987.

Elaine S. Ackerman
c/o Fink, Weinberger, Fredman
Berman & Lowell, P.C.
551 Fifth Avenue
New York, New York 10176

APPLICATION FOR JUDICIAL APPROVAL
OF
AUM USA COMPANY, LIMITED

STANLEY S. OSTRAU

I, ______________, a Justice of the Supreme Court of the State of New York of the First Judicial District, in which the office of the corporation is to be located, do hereby approve the foregoing Certificate of Incorporation of AUM USA COMPANY, LIMITED and consent that the same be filed.

Dated: MARCH 1, 1988
New York, New York

Justice of the Supreme Court
First Judicial District
STANLEY S. OSTRAU

Dec. 31, 1987

THE ATTORNEY GENERAL HAS NO OBJECTION
TO THE GRANTING OF JUDICIAL
APPROVAL HEREON AND WAIVES
STATUTORY NOTICE.

ROBERT ABRAMS, ATTORNEY GEN.
STATE OF NEW YORK

by Howard Holt
HOWARD HOLT
[illegible] Attorney

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 5b.

Charities Registration Statement

518-474-3720

THIS FORM IS BEING FILED WITH (check appropriate box/es):

☐ OFFICE OF THE ATTORNEY GENERAL
CHARITIES BUREAU
120 Broadway
New York, NY 10271

☑ OFFICE OF CHARITIES REGISTRATION
NYS DEPARTMENT OF STATE
162 Washington Avenue
Albany, NY 12231

annual financial report

USE ONLY	
DATE REC'D	AMOUNT
CASH BK #	REG NO
DATE ACCT	EXAMINED BY

INSTRUCTIONS – Type or print in ink the answers to all items applicable to the charitable organization. This form needs to be filed with the Office of the Attorney General if the organization is a New York charitable organization or holds property or does business in New York for charitable purposes. This form needs to be filed with the Office of Charities Registration if the organization solicits contributions in excess of $25,000 or pays anyone for fund raising services. If both sets of circumstances exist, the organization must file with both offices.

1 ORGANIZATION'S NAME: AUM U.S.A Co, Ltd.

2 PRINCIPAL STREET ADDRESS: 8 East 48th St. #2E (2nd Floor), New York, N.Y. 10017
CITY: New York COUNTY: New York STATE: New York ZIP CODE: 10017

3 MAILING ADDRESS (IF NOT SAME AS 2, ABOVE)
CITY COUNTY STATE ZIP CODE

4 PRINCIPAL NEW YORK STATE ADDRESS (IF NOT SAME AS 2, ABOVE)
CITY COUNTY STATE ZIP CODE

5 ADDRESS WHERE BOOKS/RECORDS ARE KEPT (IF NOT SAME AS 2, ABOVE)
CITY COUNTY STATE ZIP CODE

6 LIST ALL NAMES UNDER WHICH ORGANIZATION SOLICITS: AUM U.S.A Co, Ltd.

7 DAYTIME TELEPHONE NUMBER: (212) 421-3687

8 DATE FISCAL YEAR ENDS (MONTH / DAY): 2/28

9 DATE AND STATE IN WHICH INCORPORATED OR ESTABLISHED: 12/8/1987

10 DATE BEGAN DOING BUSINESS IN NEW YORK STATE: 5/9/1988

11 DATE BEGAN MAINTAINING ASSETS IN NEW YORK STATE: 12/8/1987

12 Has the organization ever been registered with the NYS Office of the Attorney General or the Office of Charities Registration? ☑ YES* ☐ NO
*If YES, specify:

	PRIOR REGISTRATION NUMBER	NAME OF ORGANIZATION (IF NOT THE SAME AS ITEM 1, ABOVE)
☑ ATTORNEY GENERAL	04/817	
☐ CHARITIES REGISTRATION		

13 NAME PROFESSIONAL FUND RAISERS (PFR), FUND RAISING COUNSELS (FRC) AND COMMERCIAL CO-VENTURERS (CCV) WHO ARE ACTING OR HAVE AGREED TO ACT ON BEHALF OF THE ORGANIZATION AND CONTRACT PERIOD

PFR, FRC, CCV	ADDRESS	CONTRACT PERIOD
N/A		

14 Has the organization applied for or been granted tax exemption by the U.S. IRS? ☐ YES* ☑ NO
*If YES, enter federal identification number or date of application:

15 Has tax exemption ever been denied/cancelled? ☐ YES* ☑ NO
*If YES, name agency and date of denial:

DOS 410 (Rev. 7/81)

~~244~~

16 DESCRIBE PURPOSES OF ORGANIZATION

AUM U S A Co, Ltd is non profit religious organization
The purposes for which the corporation is formed are to fostel spiritual development through the study and practice of eastern philosophy and religon to encourage means for extending awareness, such as meditation, seminars, classes, workshops, to offer nutritional information and exercises which will further the development of spiritual well-being.

17 DESCRIBE PROGRAMS FOR WHICH CONTRIBUTIONS ARE SOLICITED

Operating expenses

18 LIST DIRECTORS, OFFICERS, TRUSTEES AND OFFICIALS IN CHARGE OF OVERALL MANAGEMENT, INCLUDING THOSE WHO SIGN REPORTS SUBMITTED TO THE BOARD

NAME	ADDRESS	TITLE	TERM OF OFFICE
Chizuo Matsmoto	Same as 2. Above	President / director	One year
Fumihiro Joyu	Same as 2. Above	Treasurer / director	One year
Toshiyasu Ouchi	Same as 2. Above	Secretary / director	One year

19 LIST CHAPTERS, BRANCHES AND AFFILIATES THAT SHARE IN CONTRIBUTIONS OR OTHER REVENUES RAISED IN NEW YORK STATE

NAME	ADDRESS
N/A	

20 LIST NAME, ADDRESS AND ACCOUNT NUMBERS FOR ALL BANK ACCOUNTS MAINTAINED BY THE ORGANIZATION

BANK NAME	ADDRESS	ACCOUNT NUMBER
Daiwa Bank Trust Company	75 Rockefeller Plaza, New York N.Y. 10019-6961	80000915

21

A) Is the organization authorized by any other government authority to solicit contributions? ☐ YES* ☑ NO

B) Has the organization or any of its officers, directors, executive personnel or trustees ever been enjoined by any court from soliciting contributions or been found to have engaged in unlawful practices in connection with the solicitation or administration of charitable assets? ☐ YES* ☑ NO

C) Has the organization's registration or license been suspended by any government agency? ☐ YES* ☑ NO

*If YES to A, B or C, attach a complete statement of details.

VERIFICATION -- We, the registrants, verify under penalty of perjury, that the information furnished in this statement is true and correct to the best of our knowledge and belief.

X Fumihiro Joyu — Treasurer — 8/23/1993
Signature of President or other authorized officer of organization — Title — Date

X Fumihiro Joyu — Treasurer — 8/23/1993
Signature of Chief Fiscal Officer — Title — Date

ENCLOSE APPROPRIATE DOCUMENTS:

- **Certificate of Incorporation, By-Laws or other organizational documents and amendments**
- **Certificate of Authority, if a Foreign Corporation**
- **Federal 990s or Audited Financial Statements***
- **Letter of Tax Exemption**
- **For registration with the Department of State's Office of Charities Registration, enclose a one-time $25 fee (check or money order made payable to the Department of State); no fee is required for registration with the Office of the Attorney General.**

*If registering with the DOS Office of Charities Registration, submit a copy of federal (IRS) Form 990, audited financial statement or other financial statement for the latest fiscal year. If registering with the Attorney General, enclose the latest 990 or 990 PF (if prepared), or other financial report.

Senate Permanent Subcommittee
on Investigations
EXHIBIT # 5c.

NIKOLA TESLA

International Tesla Society, Inc.
P.O. Box 5636
Colorado Springs, CO 80931
United States of America

(719) 475-0918
Fax 475-0582

1/23/95 会員になる ~ 1/24/96 有効

Welcome to the International Tesla Society!

By joining the International Tesla Society you have become a member of an organization dedicated to bringing long deserved recognition to Nikola Tesla and his many inventions.

As a member, you will receive the Society's official quarterly magazine, ***Extraordinary Science***. You will also receive our quarterly members only newsletter, ***After Hours***—an inside summary of International Tesla Society activities. We'll be telling you about upcoming articles, speakers, conferences, and all sorts of other interesting membership news.

As a member, you are eligible for discounts on our science conferences and other limited activities. You are entitled to a 10 per cent discount on any books ordered through our museum bookstore's mail order outlet. Our toll free ***order hotline*** for books or conference registrations number is (800) 397-0137.

Your support of the goals of the International Tesla Society is deeply appreciated and never taken for granted. It will help bring recognition to many of the ideas Nikola Tesla pioneered.

I am looking forward to serving you and will strive to insure that our association will be a long one.

With Warmest Regards,

J.W. McGinnis

J.W. McGinnis
President
International Tesla Society, Inc.

1/23/95 ~ 1/24/96 会員

(Science の本)

- Mc-Graw-Hill Bookstore

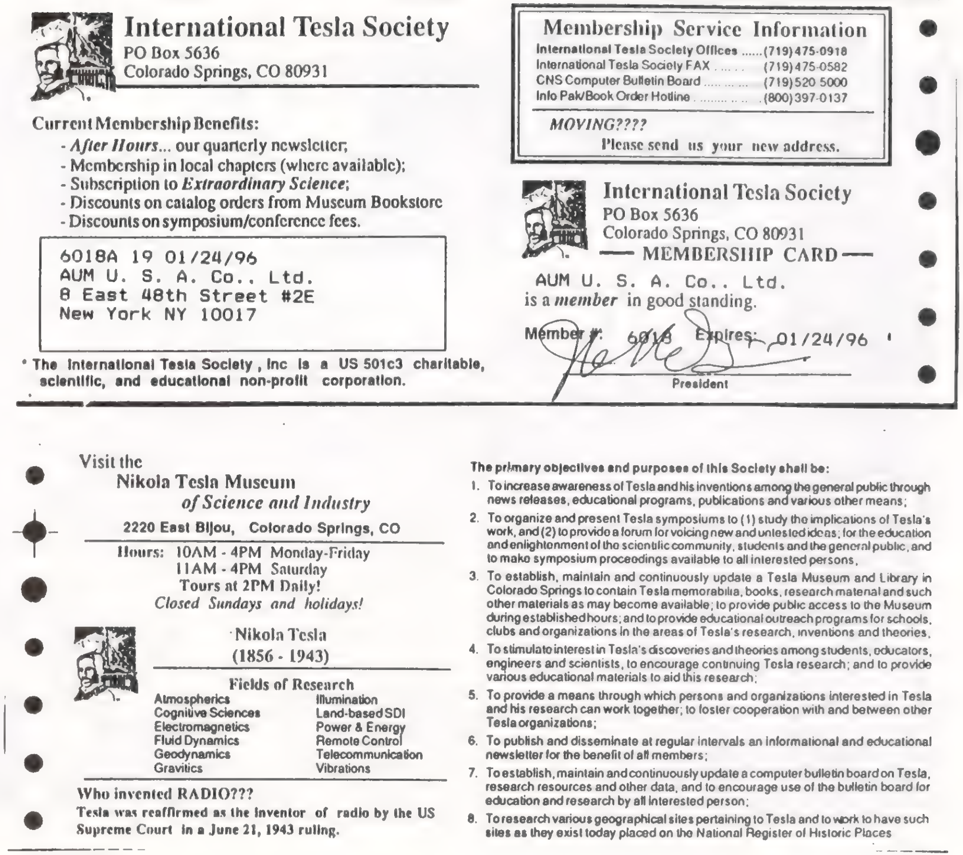
tell 512-4100
Fax 512-4105

- Tesla Society
  - テスラ学会 / M~Fri (10 ~ 4 pM)

tell 719-475-0918
Fax 719-475-0582

at Colorado Springs

I.T.S.
PO Box 5636
Colorado Springs
CO 80931



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(1856 - 1943)

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8. To research various geographical sites pertaining to Tesla and to work to have such sites as they exist today placed on the National Register of Historic Places

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 5d.

Beyond LIFE AND DEATH

The Spirit of Truth, His Holiness the Master Shoko Asahara

"The moment I attained enlightenment I was able to understand what Buddha Sakyamuni really wanted to convey. This great teacher left a concrete method of practice with which anybody could attain enlightenment. Unfortunately, no one was able to understand it. Now, I understand it. I must be the only one in the world. Since this has come to pass, I will present his system called the Origination of the Twelve Conditions anew to the world, and I will spread the true meaning of this teaching . . ."

The True Victor, Buddha Sakyamuni, was truly a great being. He attained enlightenment after many years of ascetic practices. His noble teachings have survived a great span of time, been handed down to the present generation, and now give spiritual support to many people. We should not, however, regard his enlightenment as something special because anyone can attain enlightenment. Anyone who practices the path can reach the state of absolute freedom and bliss. Enlightenment has been considered difficult because a specific method of practice has not been known.

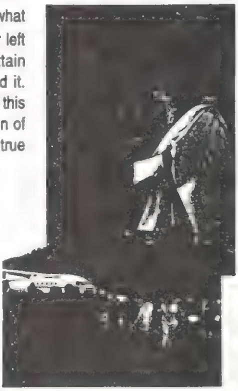
I myself thought enlightenment was merely a wild dream. Nevertheless I had a strong desire to experience it. This is because my life was nothing but suffering in those days. I thought, "the only way to get out of this suffering is to attain enlightenment." I threw away everything and plunged into the practice. There was no one to guide me. My path was indeed trial after trial and error after error.

After a long and arduous eight years of practice, I finally attained enlightenment. At the same time I was shocked. I discovered that Buddha Sakyamuni had revealed a path to enlightenment for future practitioners. It was called "the Origination of the Twelve Conditions." Many of you may have heard of this teaching for it is quite famous. It is the central teaching of the *Agama Sutras*, which the leading disciples of Buddha Sakyamuni compiled shortly after the Buddha died and entered Parinirvana. These sutras (scriptures) are therefore considered the most faithful rendition of the original teachings of Buddha Sakyamuni. But the problem was that nobody was able to understand their profound meaning. There have been some Japanese translations, but they are merely superficial. However, the moment I attained enlightenment I was able to understand what this great teacher really wanted to convey. Buddha Sakyamuni left a concrete method of practice with which anybody could attain enlightenment. Unfortunately, no one was able to understand it.

Now, I understand it. I must be the only one in the world. "Since this has come to pass," I said to myself, "I will present this system called the Origination of the Twelve Conditions anew to the world. I will spread the true meaning of this teaching!" My aspiration grew stronger. If I could disclose the meaning of 'the Origination of the Twelve Conditions' and explain it with my own experience, it would be a precious gift for those who aspired to attain enlightenment. I feel that it is my mission to accomplish this task.

Now let me explain Kundalini. Kundalini is a spiritual energy which raises the human spirit to higher dimensions. Every one of us has this energy within, but it is dormant in an ordinary person. If you wish to attain enlightenment, the first thing you should do is awaken it. This is called 'the awakening of Kundalini.' Buddha Sakyamuni attained enlightenment by continuing his practice after he had awakened his Kundalini. It was the same with me. After awakening Kundalini, one attains final enlightenment when one has perfected the six kinds of Yoga. These six kinds of Yoga are:

1. Heat Yoga
2. Bardo Yoga
3. Dream Yoga
4. Illusory Body Yoga
5. Light Yoga
6. Consciousness Transferring Yoga



By invitation of the government, His Holiness Shoko Asahara paid an official visit to Bhutan. In this kingdom, where the state religion is Tantra-Vajrayana, he was given the title 'His Holiness.'

On sale starting April 8, 1993 (Sakyamuni's birthday!)

About two thousand five humdred years ago, Buddha Sakyamuni entered a forty-nine day samadhi under the Bodhi Tree. He attained the final stage of Enlightenment after completely recognizing and experiencing all the processes of Anti-Mystic Power, Formation of Experience, Discrimination, Mental Element & Form-Appearance, as well as the Six Sense Elements & their objects Touch, Sensation, Craving, Grasping, Being and Birth. Then, at Samath, the First Wheel of Dharma was turned and gradually the Law of the Truth was spread all over the world. His Holiness, who attained the final stage of enlightenment in the Himalayas in 1986, will, for the first time in the world, reveal the entire process of Buddha Sakyamuni's Origination of the Twelve Conditions It is so profound that no one else has ever understood its true meaning

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The Six Yogas correspond to the six Chakras, and the higher the stage of Yoga, the higher the corresponding Chakra. I have come to this understanding as a result of practicing with Indian Yogic scriptures. In other words, my understanding is based on my empirical knowledge. To my surprise, I learned later that the Kagyu lineage of Tibetan Buddhism also has the same idea. Tibetan Buddhism is said to have produced the most spiritual achievers. Does this fact imply that all paths to the ultimate goal of enlightenment are one and the same in the end?

• Light Yoga

Before long, one reaches the level called 'Light Yoga', which is the last Yoga in the stage of Samadhi. Through this Yoga, one realizes the meaning of the lights which compose this world and the worlds of other dimensions. This concept is rather difficult to grasp, so examples should be helpful. Let me explain it step by step as it had happened to me. I was practicing in the Himalayas and at Mt. Fuji when all of these things happened.

I concentrated my mind on the Ajna Chakra at my forehead and saw 'the Divine Element of the Universe.' The Divine Element of the Universe is a transmission from the heart of the universe which is also called 'the Akashik Record.' It is a gigantic ball of light, into which I melted. To be precise, it felt as if I had melted, for I discovered after my practice advanced further that I was connected to the ball of light by two streams of red-purple light. One emanated from the Brahmarandhra (the crown of the head), and the other emanated from the heart. The ball was so huge that it was difficult to gauge its shape at one look. The following description is the result of my having melted into the ball many times after that.

Its center is transparent. The colors change, mixing from blue to violet, as they go further away from the center, until they become red on the periphery. There are countless minute dots in motion in the clear part in the center. The nearer to the center the dots are, the whiter they are; the further they are, the blacker they are. Each of these dots is a piece of information. The white dots in the center are pieces of information on a universal level, while the dots further away from the center carry more individualized information. I draw my information from the Akashik Record whenever someone asks me to make a prediction.

After eight years of strenuous practice of Yoga and Buddhism, His Holiness the Master, Shoko Asahara attained final enlightenment in the Himalayas in 1986. He founded Aum Shinrikyo in 1987 and continues to devote himself to the severe practice of the Mahayana path. As a guru (spiritual teacher) with incomparable skills, he has to date guided more than 350 disciples to various stages of enlightenment.

Master Asahara's high meditational stage is highly regarded by spiritual masters in traditional Buddhist countries like India, Sri Lanka, and Bhutan. A Tibetan reincarnated lama acclainmed Master Asahara as Yeshe (one who has attained perfect, absolute divine wisdom). With divine powers developed through the practice of meditation and enlightened wisdom, Master Asahara shows his genius not only in the spiritual domain. Other areas of his experience include: science, medicine, music, writing, translation, education, etc. In this age of crisis, his unique leadership, altruism and devotion has great significance for the realization of world peace and the survival of human beings.

Also, through frequent contact with saints of different countries, His Holiness Shoko Asahara has actively been promoting the protection of Buddhism and peace. His Buddhistic practice has been highly recognized internationally. In 1992, he was invited by the government of Bhutan whose state religion is Tantra-Vajrayana, and was awarded their highest title: "His Holiness".

In April, Radio Aum Shinrikyo started broadcasting in Japan via Radio Moscow. In June, it began broadcasting around the world, advancing His Holiness' plans for salvation.

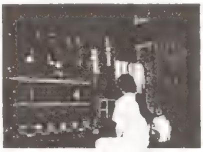
Aum Shinrikyo, as of September 1992, has 10,000 lay practitioners (members) and 700 disciples (monks and nuns). There are 22 branch centers in Japan and 4 overseas, (New York, Bonn, Sri Lanka and Moscow).

After a few days had passed, I experienced the lights of the Divine Element of the Universe for the first time. Thus, my practice advanced a step further. I was able to constantly stay in the light without concentrating on my Ajna Chakra. The disintegration of the Ajna Chakra was a necessary step for this to happen.

When it happened, I was in the Savasana posture. When I woke up, I found that my body was twisted from the cold. I remembered what a Yogi had told me some time ago and said to myself, "this is the state in which one's head is hot and one's feet are cold." As I straightened my body, Kundalini ascended with great force and stopped at the Ajna Chakra.

After I concentrated on the Ajna Chakra, I found myself for a while playing a drama in my Astral body. When it was over, four midgets began to make a fuss around me. My consciousness in my Astral body thought, "Don't be so noisy. I cannot concentrate." "I am here," thought another consciousness, which usually arose during my meditation without leaving my physical body. In other words, I had two consciousnesses simultaneously at that moment. Incidentally, human beings have four consciousnesses. In addition to the two consciousnesses which I was using, there is a consciousness which we use in our daily activities and another consciousness which we use while we are in a deep sleep.

Then the next moment, my Ajna Chakra was put under a tremendous pressure. It was so strong that I was afraid it might hurt my eyes, or even damage my brain. But at the same time another thought arose: "I have been waiting for my forehead to be bored for hundreds of years. I shall bear it." I kept on concentrating. Then my Ajna Chakra exploded with a big bang. My Yoga of Light was com-



Mr. Khasbulatov, Chairman of the Supreme Soviet (the most powerful Russian politician next to President Yeltsin), said, "the Master has been engaged in truly great activities which propagate the pure and sublime teachings of Buddhism in Japan and all over the world. I wish him good health and further success in his endeavors."

pleted at this moment.

Now, I was always in light. My Ajna Chakra shined brightly like fire. On one occasion, I saw the Space element during my meditation. It was made of blue light and was round in shape with a slit in one place. Rotating counterclockwise, it wound its way toward my Ajna Chakra. When it was closer, I saw that it had been tugging something along on its right. It was then absorbed into my Ajna Chakra. At that moment I knew that what the Space element was tugging along was the inner vision in my heart. This is the source of life called the Causal Body which is situated in the heart.

The Causal Body consists of six orbs of light. They are: the True Self, Chitta (Mind-Stuff), Ego, Subtle Vital Energy, Subtle Nature, and Brahman the Absolute. The True Self is a transparent diamond-like light which looks like it is reflecting off the surface of a lake. Chitta is light blue; Ego, bluish-green; Subtle Vital Energy, rose-pink; Subtle Nature, orange; and the orb of Brahman is white.

Here the description of the Causal Body is limited only to its colors because I want to mention it only briefly. I will explain it in detail some other time.

One day I noticed that one's feelings could also be expressed by lights. Through my clairvoyant power, I saw 'the Orb of Will' and 'the Orb of Images' at the Brahmarandhra (situated at the crown of the head) change their colors in accordance with experience. For example, when one is sexually arosed, the orb becomes dark-red in color and makes a wavy motion.

Ultimately you realize that light is the highest of all the elements which compose the universe. (The entire universe is composed of light, sound vibration, and gross substance.)

I shall end my explanation of the Five Yogas, which should be practiced in the stage of Samadhi. All of these Yogas are important steps toward the goal of enlightenment. What one uses at one's last moment is the Yoga of Transferring Conciousness, which I will deal with in the section on Enlightenment.

(My apologies: there is not enough space here to explain all about the four Yogas - Bardo Yoga, Dream Yoga, the Yoga of the Illusory Body and the Yoga of Light. Their profound meaning cannot be covered in a few pages.)

• *Omniscience* - Knowing the Truth

After you have mastered Samadhi, you enter the stage called *Omniscience*. Let me tell you about the realization I reached through Samadhi. It can be summarized as follows:

1. Everything is in flux. Everything in the whole universe and in all dimensions undergoes change and never keeps its original form.

2. No concept or idea belongs to one's True Self: no fixed or common ideas in this society belong to one's True Self.

3. Existence itself is the source of negative deeds. For all beings, including human beings, existence itself induces the cause for negative deeds. For instance, we kill or lie so that we may live.

Hence, I have reached the conclusion: "Everything is suffering." This is *Omniscience*. One obtains omniscience by knowing everything through Samadhi. You will also come to this inevitable conclusion when you have achieved this stage.

(excerpted from *Beyond Life and Death*)

His Holiness, Master Shoko Asahara, the Spirit of Truth, attained the final stage of Enlightenment in 1986 in India, the same place as Buddha Sakyamuni. Soon after, he founded a religious group of monks and nuns and has since engaged in the activities of a Mahayana Buddha. His organization is highly regarded overseas, especially by various Buddhist countries.

His Holiness and Aum Supreme Truth were invited in September 1991 to be the guests of state in Sri Lanka. It is the most revered country of the Upper Seaters (Theravada Buddhists). During this visit, His Holiness was welcomed cordially everywhere he went. The Prime Minister himself offered him a relic of Buddha Sakyamuni. This is the most precious treasure of the Buddhist schools.

His Holiness the Dalai Lama, (the highest political and religious leader in the Tibetan government:

"Your experience is solid and very interesting. I recognized that you practiced Tantra in your past life. You should spread true religion all over Japan. You can do it. I will always be blessing you and watching over you." (In 1987, at Dharmsala, India)

"Aum endeavors to awaken people through religious and social activities. They teach the method of meditation and they themselves are continuously practicing the tradition of Mahayana Buddhism." (From an autographed letter, May 1989)

"I always look forward to seeing Master Shoko Asahara. He always practices hard."

His Holiness was welcomed cordially as a guest of state in Laos, a Southeast Asian nation whose state religion is Buddhism. Four hundred Buddhist priests and lay practitioners, both men and women, welcomed the Master and his staff at the Laos airport.

Reverend Ananda Maitreya, who is called "a man of the greatest wisdom" throughout the Southern Route Buddhist countries, which include Sri Lanka, said:

"When I first met the Master, I could immediately tell that he was one of the greatest holy persons presently existing on this earth. He is a great religious master. He has attained an extremely high spiritual stage. Although I have met many practitioners and spiritual gurus, I have never met such a great guru as Master Asahara." (May, 1992, in Barangoda, Sri Lanka)

The True Victor

His Holiness meets with Bishop Peterium, the most influential person of the Russian Orthodox Church. They agree to cooperate with each other in salvation activities, superceding religious boundaries.

Egypt, July 1987

Years before visiting Egypt, His Holiness obtained, through the practice, one of the supernatural divine powers called Divine Knowledge of Past Lives by which he could see his many past lives. Therefore, His Holiness knew that in one of his past lives he was a minister in Egypt. And, as in this present life, he had mastered the secret processes, attained supreme enlightenment, and was a guru of the Pharaohs.

"The Master has great wisdom and a great understanding of Dhamma. He has a profound and immeasurable love. He has a desire to help every sentient being. Therefore, if you practice under him, take refuge in him, receive the ten precepts and Bodhisattva vows, and devote yourself to the various practices of Vajrayana and Tantrayana, you will be able to attain Buddhahood within this life time, or during the intermediate state after death, or within a few of your future lives." (The late Kalu Rimpoche, a great meditation master of the Kagyu lineage of Tibetan Buddhism.)

The Master, along with Aum Supreme Truth's scientists and technical experts, held a heated discussion on the future of quantum mechanics with the president of the Moscow Institute of Technology and Physics. Dr. Bashov has won the Nobel Prize for his research on the laser. The Master has for a long time pointed out that the goal at which modern theoretical physics ultimately aims coinsides with the Truth, the Buddhistic view of the world and its Law. This exchange of views and opinions with such eminent physicists demonstrates Aum's approach of proving the Truth scientifically.

"Chyren," the Russian Aum Supreme Truth Symphonic Orchestra, plays astral music. Astral music is a representation of the sublime, holy and wonderfully beautiful sounds which are always heard in the Upper Realm of Form (in Tibetan Buddhism, the world of Sambhogakaya). They can only be heard by those who have attained samadhi. Throughout history, great musicians and some enlightened people have been able to perceive these sounds. His Holiness Shoko Asahara, who has attained the final stage of enlightenment, moves between the Upper Realms of Form and the Gross World during samadhi. He composes various songs in the Gross World by putting together each melody he has retained from the Upper Realms of Form. This is a revolutionary type of music which has never existed in human history.

Khamtul Rimpoche, an incarnated Nynma master:

"You have attained the highest stage of self realization. That is the stage of 'Yeshe' (perfect, absolute divine wisdom). Your sole purpose in life is salvation." (May, 1991, at Dharmsala, India)

"If Master Asahara can obtain the general public's cooperation, he will become the true Master of Buddhism. Then, it will be accepted by many people, and he wil be able to establish the true Law of Dhamma once again in Japan." (From an autographed letter, May 1989)

AUM
SHINRIKYO
(SUPREME TRUTH)

Senate Permanent Subcommittee
on Investigations
EXHIBIT # 5e.

Transcript of video message by Shoko Asahara, taped for NHK-TV, March 24, 1995:

Due to the media reports and police announcements, you may be thinking that Aum Supreme Truth actually produced sarin and carried out the attacks in the subway. Before I touch upon this incident, I must explain how this situation came about. Without this knowledge, you won't be able to understand these media reports.

First of all, my body is very weak now. I'm affected by Q-fever rickettsia, which is also affecting about 50% of the 1,700 monks and nuns—my disciples who have renounced their secular lives. Rickettsia is an extremely harmful virus, as harmful as any pestilence, and it has been sprayed on us repeatedly. Poisonous gases like sarin and yperite were also sprayed. Although antibiotics are helping us to sustain our lives, we are in a very critical condition. For this reason I appeared in public only a few times after May 1994. We repeatedly announced these incidents to news agencies, but the media never raised the issue.

We act on the basis of prophecies. In 1997 and 1998 most of Japan's large cities will suffer major damage in a war between the U.S. and Japan. Then the Japanese economy will collapse. Japanese assets will be lost. Reviving the nation after this collapse is one goal of our Mahayana practice and salvation activities.

From the beginning, our activities have been legal. However, many incidents hampered our efforts. For example, the media and the National Public Safety Commission prevented us from making necessary purchases. They also pressured suppliers to stop exporting their commodities to us. As a result we were forced to produce everything on our own for 1,700 monks and nuns. Several hundred different chemicals were necessary for this purpose.

For example, several newspapers wrote yesterday about the potassium cyanide found in Aum's complex. The chemical is used for gilding—plating Buddhist statues. Yet it is an extremely poisonous compound. Ordinarily, if a person possessed such a poison, the police would naturally suspect him of planning a murder. However, these industrial chemicals are bought and sold by the ton. Thousands of tons of these chemicals are used in Japan annually. Without them, we actually could not live or engage in our religious activities. This is because it is hard for Aum Supreme Truth to buy things.

Now let me talk about the main topic.

The media report that the police found three chemicals near the Satyan No. 6 building, in which the police say I reside. These chemicals are phosphorus trichloride, sodium fluoride, and isopropyl alcohol. The police say they found them there, and it is probably true. However, you should understand the following.

Since last year some magazines have been spreading rumors about Aum Supreme Truth producing sarin. We deny their accusations. So why did the police find these chemicals in warehouses near the Satyan No. 6 building, which they say is my residence? This clearly indicates that Aum Supreme Truth had no idea they were related to the production of sarin.

Why is this so? Aum Supreme Truth sells a variety of products so that monks and nuns can live in the order. For example, we have become the first or second largest seller of DOS/V personal computers in Japan. Sodium fluoride is a raw material for ceramic coatings. We have made plans to start selling chinaware in 1995 or 1996, which is made with sodium fluoride. The goal of this project was to offer cheap but beautiful chinaware to many people through mass production.

We purchased phosphorus trichloride for two reasons. The first was to study its properties as a plasticizer in the production of plastic goods. Our 1,700 monks and nuns currently use plastic containers. We had also expected to sell our plastic products in the future. The second reason was that we need phosphorus trichloride to produce fertilizer and other agricultural chemicals for hydroponics. This would be used in the event Japan suffered major damage.

What about isopropyl alcohol? According to scientists, the production of sarin requires isopropyl alcohol. But you can easily obtain it by going to a drug store. Like ethanol, it is widely used as a disinfectant.

Therefore, even though a large quantity of sodium fluoride was found, it is only a material for ceramic coatings. Even though phosphorus trichloride was found, it is only used as a plasticizer in the production of plastic products. The buildings of Aum Supreme Truth throughout Japan occupy a total area four times larger than Korakuen Baseball Stadium. Phosphorus trichloride was used in the fireproof structure of our buildings. We were also planning to use it for fertilizer and other agricultural chemicals in hydroponics. Lastly, we needed a large amount of isopropyl alcohol because there are more injuries as the number of monks and nuns grows.

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 7

UNITED
NATIONS

Security Council

Distr.
GENERAL

S/1995/864
11 October 1995

ORIGINAL: ENGLISH

NOTE BY THE SECRETARY-GENERAL

1. The Secretary-General has the honour to transmit to the Security Council a report submitted by the Executive Chairman of the Special Commission established by the Secretary-General pursuant to paragraph 9 (b) (i) of Security Council resolution 687 (1991).

2. The present report is the eighth submitted under paragraph 8 of Security Council resolution 715 (1991) of 11 October 1991, by which the Council requested the Secretary-General to submit a report to the Security Council every six months on the implementation of the Special Commission's plan for ongoing monitoring and verification of Iraq's compliance with the relevant parts of section C of Security Council resolution 687 (1991). It updates the information contained in the first seven reports (S/23801, S/24661, S/25620, S/26684, S/1994/489, S/1994/1138 and Corr.1 and S/1995/284).

3. Further information concerning developments since the last report submitted under resolution 715 (1991) is contained in the report to the Security Council of 20 June 1995 (S/1995/494), the ninth report provided in accordance with paragraph 3 of resolution 699 (1991).

Annex

Report of the Secretary-General on the status of the implementation of the Special Commission's plan for the ongoing monitoring and verification of Iraq's compliance with relevant parts of section C of Security Council resolution 687 (1991)

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I. INTRODUCTION

1. The six months which have elapsed since the last report submitted to the Security Council under paragraph 8 of resolution 715 (1991) have been among the most eventful in the history of the Special Commission, both in respect of relations with the Government of Iraq and of the progress made in obtaining information regarding Iraq's programmes for production of weapons of mass destruction and missiles with a range greater than 150 kilometres. While the present report is submitted pursuant to resolution relating to ongoing monitoring and verification, the Commission has repeatedly pointed out that a full understanding of all aspects of Iraq's programmes for weapons of mass destruction is essential to the planning and the operation of an effective system of monitoring to ensure Iraq's compliance with its undertaking not to use, develop, construct or acquire any of the items proscribed to it under paragraphs 8 and 9 of resolution 687 (1991), namely "(a) all chemical and biological weapons and all stocks of agents and all related subsystems and components and all research, development, support and manufacturing facilities related thereto; (b) all ballistic missiles with a range greater than 150 kilometres, and related major parts and repair and production facilities".

2. While describing the developments which have taken place in the conduct and strengthening of monitoring operations since April 1995, the present report contains a detailed account of the new information obtained regarding Iraq's prohibited programmes and its probable impact on the monitoring system. In the period under review, Iraq has taken important decisions to acknowledge its offensive biological weapons programme and documents are being obtained in all areas. However, much of the new information contradicts earlier declarations by Iraq and some assessments made by the Commission now must be revised. A more enduring and coherent explanation of past activities must be provided by Iraq in the new full, final and complete disclosures which it is to submit in all areas, as described more fully elsewhere in this report.

3. The Commission's report in April 1995 (S/1995/284) contained, in its paragraphs 3 and 4, a comprehensive description of the concept of operations underlying the Commission's monitoring system. It is worth while, in the light of developments in the last six months, to recall the sections in that description which explain the importance of a full knowledge of Iraq's prohibited programmes for the monitoring system and for confidence in its effectiveness and comprehensiveness. These require:

> "Possession by the Commission of a full picture of Iraq's past programmes and a full accounting of the facilities, equipment, items and materials associated with those past programmes, in conjunction with full knowledge of the disposition of dual-purpose items currently available to Iraq, the technologies acquired by Iraq in pursuing the past programmes, and the supplier networks it established to acquire those elements of the programmes that it could not acquire indigenously. This information provides the baseline data from which ongoing monitoring and verification proceeds;

> "Knowledge of the level of technology attained by Iraq, of the production and acquisition methods it used and of the materials and equipment it had available are all key to designing a system of monitoring that addresses issues of concern and focuses monitoring effort where it would be most effective and efficient. For example, within Iraq, the system should focus more of its efforts on those technologies and production methods that Iraq is known to have mastered than on technologies and methods that Iraq is known not to have mastered, whereas, for the export/import monitoring regime, the converse would be true, with effort focusing on those items that Iraq would have to import in order to reactivate a proscribed weapons programme. Clearly, knowing where to focus effort requires knowledge of what Iraq would have achieved in its past programmes;
>
> "Similarly, knowledge of the procurement methods and routes used by Iraq for its past programmes is key to the design of an effective and efficient export/import monitoring regime. This system should be designed to be effective against the procurement routes and methods that Iraq is known to have used in the past. Testing whether it is, is predicated on knowing those routes and methods;
>
> "Full accounting for the materials, items and equipment associated with the past programmes is directly related to what assets should be monitored under the system. Dual-purpose materials, items and equipment from the past programmes must be monitored, along with other dual-purpose capabilities available to Iraq. Uncertainties relating to the accuracy or completeness of this accounting will consequently lead to uncertainties as to whether the ongoing monitoring and verification system is indeed monitoring all the materials, items and equipment which should be monitored". (ibid., para. 3 (a))

4. Under Security Council resolutions 687, 707 and 715 (1991), Iraq is obliged to provide the above information, which the Commission then verifies through its inspection, monitoring and analysis activities. Iraq is required to update its declarations on its dual-purpose activities and capabilities every six months.

5. The description in the present report of the new information received from Iraq in the period under review is intended to assist in assessing the extent to which such information, together with that previously obtained, contributes to meeting the criteria set out above. This, in turn, will bear upon the assessment of the effectiveness and comprehensiveness of the monitoring system and the extent to which it may have to be further modified and augmented to take account of recent developments. Because of the challenges to the monitoring system implied in the new revelations, this report contains, under each separate weapons heading, a detailed description of the operations of the newly designed monitoring system.

6. The present report, after summarizing relations with Iraq in the period under review, contains chapters on the various areas of responsibility of the Special Commission, namely those relating to missiles with a range greater than 150 kilometres and to chemical and biological weapons. Further chapters cover the Commission's support and other responsibilities in the nuclear area; other activities, such as those in relation to the export/import mechanism; and

finance, organization and air support. The final chapter contains the conclusion of the Commission on the developments which have occurred in the last six months.

II. RELATIONS WITH IRAQ: DEVELOPMENTS: VISITS BY THE EXECUTIVE CHAIRMAN TO IRAQ

A. Summary of the Executive Chairman's visits

7. During the period under review, the Executive Chairman has paid five visits to Baghdad to maintain contact with the most senior levels of the Iraqi Government and to seek to expedite the work of the Commission, particularly in relation to Iraq's prohibited programmes, by pressing the Government to follow a policy of complete and frank disclosure. This was specially important in respect of Iraq's biological weapons programme, which the Commission's experts had determined to be of very significant proportions, despite Iraq's constant denials that it had done anything more than limited research.

8. The Executive Chairman's visits took place as follows: 29 May to 1 June, 30 June to 2 July, 4 to 6 August, 17 to 20 August and 29 September to 1 October 1995. Two visits were also paid to Baghdad by the Deputy Executive Chairman, from 14 to 17 May and 17 to 20 September 1995, to address issues relating to Iraq's prohibited programmes. Information on those visits, from April to 1 June 1995, will be found in the Commission's June 1995 report (S/1995/494, paras. 4-10).

B. Cooperation, ultimatum and disclosures

9. The visits listed above illustrate the rocky road of cooperation between Iraq and the Commission in the period under review, where indications that Iraq was contemplating ceasing such cooperation culminated in an ultimatum, early in August 1995, that such cooperation would cease if, by 31 August 1995, no progress was made in the Security Council in the direction of easing or lifting the sanctions and the oil embargo. However, the ultimatum was withdrawn following the departure of General Hussein Kamel Hassan from Baghdad and his receipt of asylum in Jordan. The General had, among a large number of important responsibilities, been in charge, over considerable periods of time, of Iraq's programmes in the areas now proscribed to it. Since his departure, the Deputy Prime Minister, Mr. Tariq Aziz, has stated that Iraq has adopted a new policy of complete cooperation and transparency with the Commission and the International Atomic Energy Agency (IAEA), without any time-limit.

10. In the first of the Executive Chairman's visits, at the end of May 1995, the Deputy Prime Minister of Iraq sounded a warning that, if no prospect appeared for reintegrating Iraq into the international community through the easing or lifting of sanctions and the oil embargo, it would be difficult for Iraq to justify the expense and the effort involved in cooperation with the Commission and IAEA. Iraq required statements from the Commission that the chemical weapons and missile files were closed and the monitoring system was operational, and from IAEA that the nuclear file was closed. If Iraq received

such assurances and thus judged the prospects for reintegration to be positive, it would, in late June, address the one outstanding issue of significance, the biological issue. In response, and subsequently in his June 1995 report to the Security Council (S/1995/494), the Chairman stated that the bulk of what was required to implement paragraphs 8 to 10 of Security Council resolution 687 (1991) with regard to chemical weapons and missiles had been achieved. However, in view of Iraq's late and incomplete declarations, a longer period had been needed to identify all aspects of Iraq's programmes than might otherwise have been required. Furthermore, the major area of Iraq's biological weapons programme remained non-disclosed. Monitoring was operational in all areas. Those uncertainties which remained in the missile and chemical areas needed to be resolved and in order to do so the Commission would continue to use its rights under the relevant Security Council resolutions and the exchange of letters of 7 and 14 May 1991 on the facilities, privileges and immunities of the Commission in Iraq.

11. Upon the Executive Chairman's arrival in Baghdad on 30 June 1995, Deputy Prime Minister Tariq Aziz said that his Government had reviewed carefully the Commission's report of June 1995. While it had found the report to contain both negative and positive elements, it had concluded that the positive elements were such that Iraq would now address the issue of its biological weapons programme. The following day, on 1 July 1995, Iraq made a brief oral presentation in the course of which it acknowledged an offensive biological weapons programme, including the production of a number of biological agents, but denied the weaponization of such agents. The Chairman welcomed this disclosure but expressed the view that it needed to be augmented, particularly as regards weaponization, and had to be presented to the Commission in the form of a full, final and complete disclosure as required by Security Council resolution 707 (1991). A fuller account of this and subsequent disclosures relating to Iraq's biological weapons programme will be found in chapter V of the present report.

12. Iraq's decision to disclose its offensive biological weapons programme appeared to indicate that it was moving away from its warning of non-cooperation, expressed by Mr. Tariq Aziz during the Executive Chairman's preceding visit to Baghdad. However, this situation was abruptly reversed in the course of July 1995. On 17 July, President Saddam Hussein made a speech in Baghdad in which he indicated that his Government would cease cooperation with the Security Council if there were no progress in the Council towards the lifting of sanctions and the oil embargo. No deadline was given by the President for such progress. However, a few days later, in Cairo, the Foreign Minister of Iraq, Mr. Mohammed Saeed Al-Sahaf, made a speech in which he stated that 31 August 1995 was the deadline.

13. The Executive Chairman arrived in Baghdad for the third of his visits in the period under review on 4 August 1995. Iraq delivered to him what it stated to be its full, final and complete disclosure of its biological weapons programme, still denying that any of the agents produced had been weaponized. In a meeting with the Deputy Prime Minister, Mr. Tariq Aziz, on 5 August, the latter stressed to the Chairman that Iraq would cease cooperation with the Security Council and the Commission if there were no progress, by 31 August 1995, towards lifting sanctions and the oil embargo. The Deputy Prime

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Minister asked the Chairman to convey this information to the Security Council upon his return to United Nations Headquarters. The Chairman reached New York on 7 August, and immediately thereafter received a message from Mr. Tariq Aziz, through the Permanent Representative of Iraq to the United Nations, that the deadline was serious and that the Chairman should inform the Council accordingly. The Chairman did so, in an oral briefing to the Council on 10 August.

14. Three days previously, on 7 August 1995, General Hussein Kamel Hassan had left Baghdad, arriving in Amman the following day. On 13 August, the Executive Chairman received a letter from General Amer Rashid al-Ubeidi, Minister of Oil and former Director of the Military Industrialization Corporation (MIC), inviting him to return to Baghdad. In the letter, it was stated that the Government had ascertained that General Hussein Kamel Hassan had been responsible for hiding important information on Iraq's prohibited programmes from the Commission and IAEA by ordering the Iraqi technical personnel not to disclose such information and also not to inform Mr. Tariq Aziz or General Amer of these instructions. An identical letter was addressed to the Director General of IAEA. In a message to the Chairman on 14 August, Mr. Tariq Aziz stated that the deadline was no longer in effect.

15. The Executive Chairman and the Leader of the IAEA Action Team, in response to the invitations from Iraq, arrived in Baghdad on 17 August 1995. On the evening of that day, a plenary meeting was held with an Iraqi delegation led by the Deputy Prime Minister, and including the Foreign Minister, Mr. Al-Sahaf, the Minister of Oil, General Amer, the Under-Secretary of the Foreign Ministry, Dr. Riyadh Al-Qaysi, and other senior officials. Mr. Tariq Aziz made an initial statement in the course of which he repeated that General Hussein Kamel Hassan had, unbeknown to the senior levels of the Iraqi leadership, hidden information on the prohibited programmes which Iraq would now disclose to the Commission and IAEA. Iraq had decided on a policy of cooperation and full transparency with the Commission and IAEA, without imposing any time-limit, and also of cooperation and good-neighbourliness with the States of the region and elsewhere and of economic development in Iraq itself. Following on the plenary meeting, in a meeting devoted to Iraq's biological weapons programme, Iraq for the first time disclosed a much more extensive programme than that contained in its full, final and complete disclosure of early August 1995, admitting weaponization immediately prior to the outbreak of the Gulf war, including the filling of biological warfare agents into 166 bombs and 25 Al Hussein missile warheads.

16. In the course of the following two days, Iraq made further disclosures in regard to other prohibited programmes, including indigenous production of Scud-type missile engines, assembled from both imported and locally produced parts, and the testing of such engines. The significance of this, and its consequences for Iraq's previous statements regarding unilateral destruction of proscribed materials, is discussed in paragraphs 21, 22 and 44 below.

17. On 20 August 1995, at the conclusion of the Executive Chairman's visit, a considerable cache of documents and other materials was located and taken possession of by the Commission, as described in paragraphs 24 to 27 below.

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18. The Executive Chairman returned to New York through Jordan, thus affording the opportunity to meet General Hussein Kamel Hassan and to discuss with him Iraq's programmes in the proscribed fields. Useful information was obtained.

19. Both during and after the Executive Chairman's mid-August visit to Baghdad, expert teams in all areas of the Special Commission's responsibility held discussions with their Iraqi counterparts. The missile and biological teams obtained much valuable information, indicating programmes larger or more advanced in every dimension than previously declared. In the chemical field, after being confronted with evidence found by the chemical team in the new documentation, Iraq acknowledged a much larger and more advanced programme than hitherto admitted for the production and storage of the chemical warfare agent VX. In this regard, the Deputy Executive Chairman visited Baghdad from 17 to 20 September 1995, in the course of which he pointed out to Iraqi officials, at senior levels, the gravity of the clear deception of Iraq in its spring 1995 declarations to the Commission concerning the VX nerve agent in particular. This had been reported to the Security Council in June 1995 and the intentional deception would have to be underscored in the current report.

20. On 29 September 1995, the Executive Chairman arrived in Baghdad, for his last visit in the period under review, to assess with the Iraqi authorities the situation resulting from the recent disclosures, following on the departure of General Hussein Kamel Hassan. The Chairman expressed the view, in the various meetings which he held, that it was in Iraq's best interests to provide everything now, rather than to drag out the uncovering of information which would have an increasingly negative impact. Iraq undertook to do its best, and the Deputy Prime Minister, Mr. Tariq Aziz, pledged his Government's cooperation and full openness with regard to the implementation of Security Council resolution 687 (1991).

C. Some consequences of recent disclosures

1. Unilateral destruction by Iraq

21. Iraq's decision in 1991 to undertake, in violation of Security Council resolution 687 (1991), the unilateral destruction of various elements of its prohibited programmes has had the most severe consequences in delaying, and in rendering much more complicated, any determination by the Commission that it has a complete picture of those programmes and has accounted for all the significant components thereof. This destruction has been stated by Iraq to cover all three areas of proscribed missiles and chemical and biological programmes. Unilateral destruction of weapons, equipment and materials, including agent and precursors, has made verification, particularly of the quantities involved, extremely difficult. The Commission has thus pressed for any documentation Iraq may have relating to such destruction, including the orders to carry it out and field reports on how those orders were executed.

22. The picture is further complicated by certain recent disclosures which show that Iraq has used alleged unilateral destruction to cover up elements of its prohibited programmes which it wished to keep concealed. Possibly the most important example of this, uncovered to date, relates to the missile field.

Iraq declared in 1992 that it had unilaterally destroyed 89 Scud/Al Hussein missiles. Recent analysis by the Commission's experts, and admissions by Iraq, now reveal that only 83 missiles were so destroyed in 1991. The figure was inflated by Iraq to 89, in order to conceal its indigenous production of engines for Scud-type missiles, as reported in paragraphs 43 and 44 of the present report. This example will require the Commission to take a new look at all Iraq's declarations on unilateral destruction and for it to press for documentation and any other means of verification of such declarations.

2. Documentation

23. The Commission has, on every available occasion, stressed to Iraq that the handing over of documentation relating to its prohibited programmes is the best and quickest means for the Commission to verify Iraq's declarations relating to the programmes. Iraq, however, has sought to maintain that, some time in 1991, it issued an order to destroy all documentation on those programmes. The Commission's attempts to obtain evidence of such an order, and to ascertain precisely when it was issued, have been unsuccessful. The Commission has remained sceptical that any such wholesale destruction ever took place. It has so told Iraq on numerous occasions. It was not conceivable that all evidence would be destroyed of major and very costly scientific research and engineering undertakings, representing billions of dollars in investment and countless man-hours of work.

24. On 20 August 1995, at the conclusion of the Executive Chairman's visit to Baghdad (17-20 August), the Chairman, in a public statement, complained that, while very significant new information had been provided, not a single document, which could help in verifying that information, had been handed over. Shortly after that statement was made, and while the Chairman's team was preparing for departure to the Habbaniyah airfield, General Amer Rashid al-Ubeidi contacted the Chairman and requested that, on his way to the airfield, he visit a farm which the General stated to have belonged to General Hussein Kamel Hassan, where items of great interest to the Commission could be found. On arrival at the farm, in addition to a number of shipping containers with miscellaneous equipment in them, the Chairman and his team found, in a locked chicken house, numerous metal and wooden boxes which were packed with documentation, together with microfiches, computer diskettes, videotapes, photographs and prohibited hardware components. Orders were immediately issued to the Commission's personnel, who had been brought to the site, to secure this material and transfer it to the Baghdad Monitoring and Verification Centre.

25. Examination of the contents of the boxes at the Centre revealed well over half a million pages of documentation. While most of this related to the nuclear area, a large amount concerned the chemical, biological and missile areas. This documentation has now been inventoried and is being arranged, after scanning, on a priority basis for examination. The initial assessment of the Commission is that the bulk of the material in the missile, chemical and biological fields comes from a number of the sites where Iraq's proscribed programmes had been carried out. The amount of material varies from area to area, being more comprehensive in certain areas than in others. However, documentation from the Headquarters of the Military Industrialization

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Corporation (MIC) is not included, nor are the relevant archives of the Ministry of Defence. From recent statements made by senior Iraqi officials, the Ministry's records are still intact and detailed.

26. Since the discovery of the documents, Iraq has admitted to the Commission's personnel that, in the summer of 1991, orders were issued by a "high authority" to the directors of the sites involved in Iraq's proscribed programmes to protect "important documents" - which was understood to relate to the technology of production - by packing them, in a very brief period of time, and delivering them on demand to representatives from the special security organizations. This delivery is said to have taken place without written orders or the provision of receipts by the representatives of those organizations when they collected the packed documents. Iraq's original claim that all documentation was destroyed is thus patently false.

27. The Commission doubts that the materials obtained are all those which were gathered under the protection order issued in 1991. More such documentation must still exist, particularly in certain significant areas such as production records, Iraq's procurement networks and sources of supply. Also, the relevant MIC headquarters documentation and archives of the Ministry of Defence are missing. These are materials which must be handed over if the Commission is to be able to undertake a speedy and thorough verification of Iraq's declarations regarding its prohibited programmes. The Commission, nevertheless, acknowledges that the materials already obtained, together with the admission that the relevant documentation was not all destroyed, is one of the most significant breakthroughs in the four years of its operations in Iraq, and will provide an invaluable source of verification material. What has been started should be completed by handing over the missing documentation identified above.

3. Rationale for Iraq's biological and chemical weapons

28. Iraq's intentions with regard to the operational use of its biological and chemical weapons have been subject to conflicting presentations by the Iraqi authorities in the period under review. On the one side, it was explained that the biological and chemical weapons were seen by Iraq as a useful means to counter a numerically superior force; on the other, they were presented as a means of last resort for retaliation in the case of a nuclear attack on Baghdad. Certain documentation supports the contention that Iraq was actively planning and had actually deployed its chemical weapons in a pattern corresponding to strategic and offensive use through surprise attack against perceived enemies. The known pattern of deployment of long-range missiles (Al Hussein) supports this contention. Iraq stated, during visits of both the Chairman and the Deputy Chairman, that authority to launch biological and chemical warheads was pre-delegated in the event that Baghdad was hit by nuclear weapons during the Gulf war. This pre-delegation does not exclude the alternative use of such a capability and therefore does not constitute proof of only intentions concerning second use. It is evident that the Commission must have a complete understanding of the concept behind each stage of the development of all proscribed weapons systems, together with their intended and actual deployment plans.

III. MISSILE ACTIVITIES

A. The monitoring system

29. Pursuant to the plan for ongoing monitoring and verification, approved by the Security Council in resolution 715 (1991), the Commission has established a multi-layered monitoring system in the missile area. The system is designed to cover essential elements of Iraq's missile and related research, development, testing and manufacturing facilities and non-proscribed missiles with ranges less than 150 kilometres as defined by the plan. The system is designed to compensate the limitations of one layer of the system with the strengths of other layers. The current monitoring system includes, *inter alia*:

30. *On-site monitoring inspections*. Such inspections are carried out without advance notice by a resident expert team based at the Commission's Baghdad Monitoring and Verification Centre (BMVC). These inspections include verification of Iraq's declarations under the plan, review of related facility documentation, inspection of items produced and production techniques, and inspection of all areas and buildings at each facility. Currently, over 30 different facilities are inspected on a routine basis, with the frequency of visits dependent on the nature of activities at the specific sites.

31. *Continuous sensor monitoring*. This is directed at critical areas of missile-related activities and dual-purpose machines. On-site cameras are connected to and can be viewed remotely from the BMVC. Furthermore, the BMVC staff collect videotapes from the monitored facilities every 30 days, or more frequently if required, for detailed analysis. Tamper-proof tags and labels are used to positively identify important equipment at the facilities to assist in the monitoring of their use, movement or disposal. Currently, over 120 pieces of missile related equipment carry UNSCOM tags and labels. The Commission regularly reviews the need to upgrade, replace or add additional sensors to improve its missile monitoring.

32. *Special inspections*. Special inspection teams are tasked to address specific issues, for example assessing non-proscribed ongoing missile research and development activities. These teams are staffed by highly qualified experts in specific fields who advise the Commission of potential modifications to the monitoring regime.

33. *Compliance inspections*. Such inspection teams are used to verify information available to the Commission on Iraq's activities. These teams are also used to determine if new facilities should be included in the monitoring regime.

34. *Aerial surveillance*. The Commission uses both helicopter and high-level surveillance assets to monitor activities and the infrastructure of relevant facilities throughout Iraq.

35. After completion of the baseline process for each site being monitored, the Commission began operating the ongoing monitoring and verification system for Iraq's missile and related facilities on 17 August 1994. Since that time, the Commission has performed over 450 inspections at a variety of missile facilities

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and has installed over 40 video cameras at 16 facilities monitored for missile production-related activities. Iraq has continued to provide the support requested by the Commission in the conduct of these inspections, including, inter alia, access to production, quality control and inventory records; access to buildings, facilities or equipment located at the sites; installation of cameras and tags; and the provision of technical experts to explain designs, tests and production activities to the monitoring and inspection teams.

36. During the reporting period, the Commission conducted the second annual verification of Iraq's non-proscribed operational missiles as defined by Security Council resolutions 687 (1991) and 715 (1991), i.e. missiles with ranges less than 150 kilometres that are designed for use, or capable of being modified for use, in a surface-to-surface role with a range greater than 50 kilometres. The Commission uses tags to confirm that all such missiles are identified in Iraq and to ensure that these missile systems are not modified to ranges prohibited by the Security Council. The Commission has established modalities pursuant to which Iraq is required to present 10 per cent of its missiles, three times per year, to the Commission for its verification. The Commission selects the missiles for Iraq to present and the timing of these inspections. In accordance with the established procedures, Iraq submitted the requested number of missiles for verification by the inspection team during the second annual verification. No modifications of these missiles were detected.

37. The Commission has recently obtained information that Iraq has resumed its acquisition efforts in support of its missile facilities. Iraq placed a number of orders, both directly and indirectly (through middlemen and front companies), for the purchase of equipment, technologies, supplies and material for both missile- and non-missile-related activities at these facilities. Iraq explained that many of these efforts were in direct support of its Ababil-100 programme for indigenous development and production of surface-to-surface missiles with ranges between 100 and 150 kilometres. During the period since the last report in April 1995, Iraq has acknowledged these procurement activities, including the actual import, without notifications to the United Nations Sanctions Committee established under Security Council resolution 661 (1990), of equipment and materials. In most cases, Iraq has wrongly asserted that such equipment and materials were purchased within Iraq.

B. Destruction of proscribed items

38. In April 1995, the Commission completed an investigation of Iraq's acquisition and use of equipment for Project 1728 (production of liquid-propellant rocket engines) prior to the Gulf war. On 21 April, the Commission sent a letter to Iraq outlining measures that needed to be taken for the disposal of this equipment, including the destruction of five key pieces of production and testing equipment purchased specifically for proscribed missile activities. Iraq was also informed that all work must cease on equipment requiring destruction. The personnel in the facilities where this equipment was located apparently disregarded these instructions and continued to operate the machinery to produce parts for current missile programmes. The Commission detected the continued operation of this equipment, in contravention of the Commission's instructions, through several elements of its monitoring system,

primarily the monitoring cameras. Iraq also tried to delay the destruction of the equipment. The relevant developments were reported by the Executive Chairman to the Security Council on 2 July 1995. Shortly thereafter, Iraq agreed to comply with the Commission's decision and the destruction of the equipment was completed by the end of July 1995.

C. Proscribed programme

39. During the period since the report in April 1995, the Commission has continued its investigations of Iraq's proscribed former missile activities. These investigations concentrated on the unresolved issues mainly connected with Iraq's past research and development activities. The Commission sought additional data from Iraq and its explanations concerning work on a number of undeclared missile designs or components, missile fuels and the connections between the missile programme and other proscribed activities. These issues were addressed during the rounds of high-level talks from May until early August 1995 and additionally by the inspection team UNSCOM 122/BM 33. At that time, Iraq provided some answers to the Commission's requests, but mainly limited its admissions to cases where the Commission had evidence of Iraq's activities. However, in the majority of cases in the period prior to mid-August 1995, Iraq tried to mislead the Commission by withholding information or by attributing the case on which information was requested to some other activity. Thus, Iraq specifically denied the existence of any biological warheads, test activity with chemical warheads, any work on advanced liquid-propellant missile systems, using new materials for missile airframes (like aluminium), and missile fuels (like UDMH). Iraq also continued, in the period indicated, to falsify its accounting of missiles, warheads and supporting/auxiliary equipment.

40. During the Executive Chairman's visit to Baghdad from 17 to 20 August 1995, following on the events described in paragraph 14 above, Iraq, in contradistinction to its attitude prior to that time, disclosed substantial new information related to its proscribed missile programme. Iraq acknowledged for the first time work on advanced rocket engines, including those with increased thrust or using UDMH fuel. Iraq also admitted to the production of proscribed rocket engines made of indigenously produced or imported parts and without cannibalization of the imported Soviet-made Scud engines. Iraq further admitted that the number and the purpose of static and flight tests of proscribed missiles had previously been misrepresented.

41. As described in paragraphs 24 to 27 above, the Commission obtained boxes with documents and materials including, in addition to written documentation, videotapes, films, microfiches and computer diskettes related to missile activities. Some prohibited missile components were also found in the boxes. Apparently these documents had at one time belonged to projects that were engaged in activities such as project 144 (modification and production of missile systems), the Karama project (production of missile guidance and control systems), project 1728 (production of liquid-propellant rocket engines) and Badr-2000 (two-stage solid-propellant missile). The Iraqi representatives who had worked on these projects explained that they had been ordered to prepare a selection of the most important documents and to hand them over to the special

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security organizations. In the view of the Commission, the boxes obtained by it do not contain the full record of proscribed missile activities or a complete set of documentation which could be expected to be found at such facilities. The Commission intends to exploit fully available documents in the verification process, while continuing to press for the handing over of all the relevant documents.

42. During the Executive Chairman's visit to Baghdad from 29 September to 1 October, and the UNSCOM 123/BM 34 inspection (27 September-1 October), the Iraqi authorities provided additional information on previously undisclosed activities. It appeared that Iraq considered this to be critical and essential information on its prohibited activities and it was therefore withheld from the Commission for more than four years. At the end of September 1995, the Commission obtained new information on Iraq's testing activity, including both static and flight testing of Scud variant missile systems; several new designs of longer-range missile systems; development and testing of new liquid-propellant engine designs; development and successful testing of a warhead separation system; an indigenous design of a 600 mm diameter supergun system; and three separate flight tests of chemical warheads. Some of the previously undisclosed designs included missiles that could reach targets at ranges of up to 3,000 kilometres. The Commission also obtained information of a special missile under design for delivery of a nuclear explosive device. Since these and previous declarations substantially change the scope of Iraq's missile programme, the Commission has requested, and Iraq has agreed to provide, a new full, final and complete disclosure (FFCD) for its proscribed missile activities.

43. New Iraqi disclosures, including production of indigenous rocket engines, have a severe impact on the Commission's accounting of proscribed weapons and equipment used in the missile programmes prohibited by Security Council resolution 687 (1991). So far Iraq has failed to provide conclusive evidence on the quantity of engines produced by Iraq. Thus, the Commission has no firm basis for establishing at this time a reliable accounting of Iraq's proscribed missiles.

44. Another serious complicating factor in establishing a new accounting of proscribed weapons and items in Iraq is associated with unilateral destruction allegedly carried out by Iraq in the summer of 1991 to which reference has already been made in paragraphs 21 and 22 above. The destruction of large quantities and varieties of proscribed items carried out at that time was disclosed by Iraq to the Commission only in March 1992. However, the Commission has come to the conclusion that this March declaration and Iraq's original FFCD of May 1992 had been intentionally falsified to cover activities that Iraq intended to withhold from the Commission at that time. For example, Iraq declared that 89 proscribed operational missiles were destroyed in summer 1991, although only 83 such missiles were actually destroyed. In this case, the inflated number seems to have been put forward by Iraq to cover undeclared static and flight test activities and its efforts to produce its own missiles. Iraq later presented an incorrect accounting of missile warheads - both imported and indigenously produced - to hide its projects involving unconventional and separating warheads. Iraq presented false figures on the quantity of destroyed imported missile components and other items. Iraq has agreed to provide a new

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declaration on the material balance of proscribed weapons and other prohibited items, in the new FFCD, to correct these and other false or misleading disclosures. Until it verifies Iraq's new declaration, the Commission will not be able to provide a definite accounting of weapons (missiles, launchers and supporting/auxiliary equipment) as well as equipment and materials used in the proscribed missile programme of Iraq.

45. As may be seen from the above, during much of the reporting period, Iraq has continued to withhold information related to its proscribed missile programme. For the most part, Iraq has provided new data only when there were clear indications that the Commission possessed information from other sources. However, after the Executive Chairman's visit in mid-August, Iraq volunteered some important new information and in several cases supported these disclosures with additional documents. Nevertheless, based on the totality of the information available to it, the Commission believes that Iraq has not yet disclosed fully and completely its proscribed missile activities. The information to be included in the forthcoming FFCD will be crucial for the Commission's verification of Iraq's compliance with its obligations. For this reason, Iraq needs to provide accurate and substantiated data, including documentary evidence to support its statements, and to make suggestions for speedy and effective verification.

46. The Commission intends to continue its intensive inspection and investigation missions under resolution 687 (1991), including application of new verification methods, in order to obtain a full and complete picture of Iraq's proscribed missile activities. Iraq's cooperation, including the provision of accurate information and supporting documentation, access to personnel involved in the relevant activities and support of the Commission's inspection and monitoring efforts will be required, on a continuous basis, in order to enable the Commission to achieve this objective in a speedy and efficient manner.

IV. CHEMICAL ACTIVITIES

A. The monitoring system

47. During the period under review, four additional baseline inspections were completed in the chemical area. Monitoring and verification protocols were prepared for one research institute and three chemical storage and production sites. These activities were conducted by the chemical monitoring team stationed at the Baghdad Monitoring and Verification Centre. The Commission has thus completed baseline inspections of 62 chemical sites and 18 universities, colleges and research institutes. Over 200 monitoring inspections have been undertaken by the chemical monitoring team to date. Some site protocols will be re-evaluated in the light of recent findings that sites outside of the Muthanna State Establishment were also involved in Iraq's chemical weapons programme, a fact which has been denied until very recently. It is anticipated that information from the documents obtained on 20 August 1995 will lead to inspections at newly identified sites not yet visited.

48. During monitoring inspections in June and July 1995, the chemical monitoring team detected the unauthorized movement and use of four major items

of tagged equipment at two sites under monitoring. Iraq was immediately instructed to replace the equipment in its original position. This was done. The seriousness of this unauthorized activity and the attendant considerations of possible destruction of the equipment was underlined to Iraq at the highest level.

49. In addition to the monitoring tools and modalities described in paragraphs 30 to 34 of the chapter on missile activities in the present report, the Commission's chemical monitoring apparatus also includes 19 air samplers installed at 6 chemical production sites in Iraq. From 2 to 11 July 1995, a technical support team performed a retrofit of these samplers and reviewed their locations in order to optimize their use. As a result, several samplers were moved and some added or removed from sites. The upgraded samplers are now better equipped to withstand difficult conditions, such as humidity and chemical extremes.

50. Ten sampling pumps and supporting calibration equipment have been provided to the chemical monitoring team. This gives the team the capability to take air samples at any location in Iraq. An infrared spectrometer and a melting-point determination apparatus are currently under procurement to enlarge the range of samples which can be analysed.

51. A reverse osmosis water purification system and a complete air filtration system for the chemical fume hood has been installed in the chemical laboratory at the Baghdad Monitoring and Verification Centre. These will enhance the health and safety of personnel working in the laboratory. To ensure the health and safety of monitoring personnel in the field, protective equipment has also been procured, including HEPA filters, a variety of respirators and pressed air suits.

B. Proscribed programme

52. The new information obtained by the Commission in August and September 1995 clearly shows that Iraq's full, final and complete disclosure presented on 25 March 1995, the attachment of 27 March 1995 and the addenda to the attachment, received on 29 May 1995, are incorrect and incomplete. The new information was gathered initially from material obtained in Iraq on 20 August 1995 and subsequently admitted by Iraq during the course of technical talks undertaken by the UNSCOM 124/CW 25 inspection team. The material includes documents, videotapes, microfiches and microfilm records and computer discs spanning a large part of Iraq's chemical weapons programme.

53. In response to the Commission's statements that the March 1995 FFCD was no longer adequate, on 7 October 1995, Iraq provided the Commission with a number of revised chapters. The revised chapters, however, cover only those areas already raised by UNSCOM 124/CW 25 as examples of shortcomings in the existing FFCD. The March 1995 FFCD omitted information on major militarily significant chemical weapons capabilities, such as additional types of warfare agents, advanced agent and precursor production, stabilization and storage technologies, new types and numbers of munitions and field trials and additional sites involved in the programme.

54. During the technical talks held in Baghdad in September 1995, it became clear that Iraq was continuing to withhold important information on the extent and technical depth of its chemical weapons programme. Iraq officially stated that the March 1995 FFCD was complete and accurate and that there was no additional information available. Only belatedly did it admit shortcomings in its latest FFCD.

55. Of greatest concern are new revelations concerning the timing, extent and success of Iraq's programme for the production of the nerve agent VX. In the March 1995 Iraqi FFCD and its amendments, it was asserted that the VX programme existed only from April 1987 to September 1988, conducted only laboratory-scale production and had been abandoned because of poor agent quality and instability.

56. Based on the new findings, it is now clear that the VX programme began at least as early as May 1985 and continued without interruption until December 1990. The Commission has concluded that VX was produced on an industrial scale. Precursor and agent storage and stabilization problems were solved. Furthermore, one of Iraq's documents on this subject, dated 1989, proposes "the creation of strategic storage of the substance (VX - hydrochloride, one step from conversion into VX) so it can be used at any time if needed".

57. Significant in this context is Iraq's admission, in September 1995, of the production in 1990 of 65 tonnes of choline, a chemical used exclusively for the production of VX. This amount would be sufficient for the production of approximately 90 tonnes of VX. Furthermore, Iraq had, inter alia, over 200 tons each of the precursors phosphorous pentasulphide and di-isopropylamine. These quantities would be sufficient to produce more than 400 tonnes of VX. At present, there is no conclusive evidence to support Iraq's claims concerning the complete disposal of these two precursors and the choline.

58. Iraq's recent declarations concerning the weaponization of biological agents has rendered invalid the current material balance for chemical munitions and the quantities of weaponized chemical agents. This derives from the fact that the munitions, including missile warheads, declared as being used for biological agents had previously been declared as used for chemical weapons purposes.

59. Iraq has also admitted the development of prototypes of binary sarin-filled artillery shells, 122 mm rockets and aerial bombs. However, the new documentation shows production in quantities well beyond prototype levels. Iraq has also admitted three flight tests of long-range missiles with chemical warheads, including one, in April 1990, with sarin.

60. Iraq admitted that it had received significant assistance from abroad. This support included, at a minimum, the provision of munitions specifically designed for chemical weapons fill, technical support for the development of a VX precursor manufacturing process and the provision of technical personnel directly to the Muthanna State Establishment (MSE).

61. The recently obtained documentation contains significant information on procurement and financing for MSE. These records indicate that at least

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$100 million in procurement remains undeclared. This finding contradicts Iraqi statements that all MSE procurement had been declared.

62. The new information on Iraq's proscribed chemical weapons programme will require appropriate follow-up action, including technical analysis of the documents and expert seminars. The documentation shows Iraq's efforts to produce indigenously key precursors for chemical weapons, for example, the synthesis of cyclohexanol (a GF precursor) from phenol and the synthesis of di-isopropylamine (a VX precursor) from ammonia and acetone. In the light of this, certain proposals by Iraq to construct new facilities with dual-use capabilities will have to be considered very carefully by the Commission and the monitoring system adjusted accordingly.

63. The new information invalidates material balances provided in the March 1995 FFCD and subsequent amendments. At the present time also the Commission cannot exclude the potential existence of stocks of VX, its direct precursors and undeclared munitions in Iraq. In these circumstances, the Commission is requiring a new full, final and complete disclosure from Iraq which will give a coherent and true account of its chemical weapons programme.

V. BIOLOGICAL ACTIVITIES

A. The monitoring system

64. Monitoring in the biological area began in full on 4 April 1995, preceded by a four-month interim monitoring phase. The scope of activities and sites to be encompassed by the monitoring needs to be broad because of the inherent dual-use nature of biological technology and the ease with which civilian facilities can be converted for biological weapons purposes. The Commission has been compelled to cast a wider net in the biological field because of Iraq's incomplete disclosure of the full extent of its past biological warfare activities. In actively seeking to establish an understanding of such a programme, the Commission has had to rely less on Iraq's openness and more on its own findings.

65. Currently, 79 sites throughout Iraq are included in the biological monitoring and verification regime. These sites are comprised of:

(a) Five sites currently known to have played a significant role in Iraq's past biological weapons programme;

(b) Five vaccine or pharmaceutical facilities;

(c) Thirty-five research and university sites which have significant technology or equipment;

(d) Thirteen breweries, distilleries and dairies with dual-purpose capabilities;

(e) Eight diagnostic laboratories;

(f) Five acquisition and distribution sites of biological supplies/equipment;

(g) Four facilities associated with biological equipment development;

(h) Four product development organizations.

Of these sites, 9 are category A (most intense monitoring), 15 are category B, 10 category C and 45 category D.

66. The monitoring concept that has been implemented by the Commission includes: equipment inventory at all sites where dual-purpose equipment is located; notifications by Iraq of transfer, modification and acquisition of such equipment; placement of cameras at selected sites to observe change in activity or use of equipment; routine inspections of sites by a Baghdad-based monitoring team, primarily on a no-notice basis, and on a variable frequency; and identification of factors related to "break-out" scenarios at sites and of their possible role in proscribed activities. These monitoring activities from the Baghdad Monitoring and Verification Centre are reinforced by special inspections where investigations by most experienced specialists are desired. Key aspects of the baseline process, including identification of additional sites of interest and their capability, identification of undeclared dual-use equipment, assessment of their present and future use, are also ongoing activities that are incorporated into the monitoring process.

67. During the reporting period since 10 April 1995, over 150 inspections or visits to different sites have been made by the biological monitoring team, including over 20 inspections of the Al Hakam facility. At three sites, including Al Hakam, video monitoring, using a total of 22 cameras, supplement the other monitoring efforts. Both realtime images and recorded videotapes are analysed and the information is incorporated into the monitoring process.

B. Proscribed programme

68. While ongoing monitoring concentrates mainly on dual-use biological capabilities in Iraq, an efficient and effective monitoring is not possible without a full understanding of Iraq's proscribed biological activities. In its report to the Security Council last April (S/1995/284), the Commission stated that "it has come to the conclusion that Iraq has not provided a full and comprehensive disclosure of its past military biological programme or accounted for items and materials for that programme".

69. Up to the middle of the reporting period, Iraq continued to deny having ever had any offensive biological weapons programme or activities. It should be recalled that, in March 1995, Iraq officially submitted a new full, final and complete disclosure in the biological area which, like its original FFCD in May 1992, and other declarations since the adoption of resolution 687 (1991), adhered to the position that Iraq had had only a very small defensive biological research programme conducted by 10 people from 1985 until the autumn of 1990. The March 1995 FFCD was so contrary to the information in the Commission's possession that the Commission saw no merit in initiating verification of the

document. Essentially a stalemate developed between Iraq and the Commission. The Commission continued to collect information related to Iraq's biological weapons programme while, in parallel, trying to persuade Iraq, through a dialogue, to present a true declaration covering its biological weapons activities.

70. In April and May 1995, Iraq continued to display an uncooperative attitude. During the Executive Chairman's visit to Iraq (29 May-1 June), Iraq refused even to meet with the biological experts accompanying the Chairman. The stalemate continued through June, but with promises from Iraq of information about its biological weapons programme to be provided only in late June or early July, if Iraq at that time concluded that there were indications that progress was being made towards the reintegration of Iraq into the international community (see para. 10 above).

71. On 1 July 1995, during the Executive Chairman's visit to Iraq (see para. 11 above), Iraq did provide an oral overview of its past programme, admitting for the first time that it indeed had had an offensive biological weapons programme from April 1986 to September 1990. But while acknowledging an offensive programme that included the production of large quantities of two warfare agents at the Al Hakam facility, the overview, nevertheless, firmly denied weaponization of these or any other biological warfare agents. During technical discussions that followed this oral presentation, the Commission's experts indicated that several major issues related to Iraq's biological weapons programme - for example weaponization, earlier initiation date of the programme, larger involvement of Iraq's other establishments, and the material balance of supplies and agents - were still outstanding and urged Iraq to address those issues in a new FFCD that Iraq undertook to submit to the Commission.

72. In the second half of July, Iraq prepared a draft FFCD and the UNSCOM 121/BW 26 team was sent to Iraq to review the draft together with Iraqi personnel in order to assist them in the preparation of a document that would be amenable to speedy and effective verification.

73. The July draft declaration contained many areas in which Iraq's disclosures were inconsistent with the Commission's information or where information was missing or unclear. These deficiencies followed a pattern: they appeared to be designed to deny information that would either provide evidence of weaponization or reveal military connections with the biological weapons programme. There was also a strong suspicion that Iraq's new accounts of agent production and complex growth media consumption were manipulated to provide what Iraq hoped would pass as a credible accounting for the missing media, as previously described by the Commission in its April 1995 report (S/1995/284, paras. 62-69). The UNSCOM 121/BW 26 team strongly advised Iraq not to submit a deficient declaration.

74. Nevertheless, on 4 August 1995, Iraq officially submitted its FFCD to the Executive Chairman. This new FFCD was consistent with Iraq's oral presentation of 1 July and the July draft and ignored the Commission's suggestions. Because of the acknowledgement that Iraq's programme was offensive in nature, it was considered a breakthrough in the stalemate that had existed between the Commission and Iraq. The Commission initiated verification efforts, including

analysis by the Commission's and visiting experts of various portions of Iraq's declaration; inquiries with States concerning supplier information; detailed assessment of the new FFCD and correlation with information available to the Commission.

75. On 17 August 1995, after the events described in paragraph 14 above, Iraq informed the Executive Chairman that the full, final and complete disclosure of 4 August should not be considered valid. Iraq then presented to the Chairman a vastly different account of Iraq's past biological warfare programme that included weaponization, additional agents and additional sites involved in the programme. Iraq undertook to submit to the Commission a new FFCD. During this visit, some documents were obtained which related to the proscribed biological weapons programme. On 22 August 1995, a biological expert team (UNSCOM 125/BW 27) visited Baghdad in order to collect detailed information and clarifications on the revelations which had been presented during the Chairman's visit. A summation of the most recent revelations of Iraq's biological weapons programme follows. It should be stressed that it is solely based on declarations made by Iraq since mid-August, which remain subject to verification. At this time, therefore, the Commission can give no assurances as to the correctness and comprehensiveness of that information:

(a) Iraq stated that, in 1974, the Government had adopted a policy to acquire biological weapons. In 1975, a research and development biological weapons programme was established under the Al Hazen Ibn Al Haytham Institute at a site located in Al Salman. The work was poorly directed. Coupled with a lack of appropriate facilities and equipment, it was said the Institute achieved little and it closed in 1978;

(b) The failure of the Al Hazen Institute was claimed to be a severe setback for the programme and the following years are alleged to be devoid of any biological weapons-related activity. In the early period of the Iran/Iraq war (perhaps in 1982 or 1983), a prominent Iraqi microbiologist wrote a report expressing his concerns on scientific developments relating to biological warfare agents and suggesting that research in this subject be commenced in Iraq. It is still uncertain whether this report was followed up, but in 1985 the Muthanna State Establishment, Iraq's main facility for chemical weapons research and development, production and weaponization, recommended the commencement of a biological weapons programme. In May or June 1985, Muthanna sought and obtained endorsement from the Ministry of Defence for this programme. It was anticipated that the biological weapons research would be production-oriented and thus, in addition to laboratory-scale equipment, a pilot plant in the form of one 150-litre fermenter was purchased by Muthanna. Throughout 1985, personnel were recruited by Muthanna and by the end of the year, a staff of 10 was working on biological weapons research;

(c) Initial work at Muthanna was said to focus on literature studies, until April 1986, when bacterial strains were received from overseas. Research then concentrated on the characterization of Bacillus anthracis (anthrax) and Clostridium botulinum (botulinum toxin) to establish pathogenicity, growth and sporulation conditions, and their storage parameters. (Anthrax is an acute bacterial disease of animals and humans that can be incurred by ingestion or inhalation of the bacterial spores or through skin lesions. It produces an infection resulting in death in days to weeks after exposure. Botulinum toxin produces an acute muscular paralysis resulting in death of animals or humans.) As claimed by Iraq, there was no production of agents and the imported fermenters at Muthanna were not used. However, Muthanna was still looking ahead to biological warfare agent production and wrote a report to the Ministry of Defence recommending that the former single-cell protein plant at Taji be taken over by Muthanna for the production of botulinum toxin. The Ministry of Defence agreed but, in early 1987, before the plan could be implemented, the proposal went into abeyance for a short time owing to administrative reasons;

(d) In May 1987, the biological weapons programme was transferred from Muthanna to Al Salman. The reason for this was said to be that the biological work interfered with the (presumably higher-priority) chemical weapons programme at Muthanna. At Al Salman, the biological weapons group administratively came under the Forensic Research Department of the Technical Research Centre (TRC) of the Military Industrialization Corporation. After a slow beginning, it appeared that the biological weapons programme flourished at Al Salman. Equipment, including the fermenters, was transferred from Muthanna, new equipment was acquired, and new staff joined the biological weapons group to bring the workforce up to about 18. The research at Al Salman shifted to issues related more to the application of the agents as biological weapons. The effects on larger animals, including sheep, donkeys, monkeys and dogs, were studied within the laboratory and inhalation chamber, as well as in the field. Initial weapons field trials were conducted in early 1988. Studies of scale-up production were initiated on botulinum toxin and anthrax;

(e) The earlier proposal for the acquisition of a biological weapons production site was revived and the former single-cell protein plant at Taji was taken over by TRC in mid-1987. The plant was said to be in a run-down condition and it was not until early in 1988 that it was made operational. With a workforce of eight people, and using one 450-litre fermenter, production of botulinum toxin commenced in February or March 1988 and continued until September/October of that year. Production of botulinum toxin also was carried out at Al Salman in flasks or laboratory fermenters;

(f) Initial production fermentation studies with anthrax at Al Salman used 7- and 14-litre laboratory-scale fermenters at the end of 1988. From the beginning of 1989, the 150-litre fermenter transferred from Muthanna was used to produce Bacillus subtilis, a simulant for anthrax as a biological warfare agent. After five or six runs of producing subtilis, anthrax production began at Al Salman around March 1989. About 15 or 16 production runs were performed, producing up to 1,500 litres of anthrax, which was concentrated to 150 litres. Additional production with the laboratory fermenters was also accomplished;

(g) Towards the end of 1987, a report on the success of biological weapons work by TRC was submitted to MIC. This resulted in a decision to enter the full-scale production phase for a biological weapons programme;

(h) In March 1988, a new site for biological weapons production was selected at a location now known as Al Hakam. The project was given the designator "324". The design philosophy for the Al Hakam plant was taken from the chemical weapons research and production facility at Muthanna: the

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buildings were to be well separated, research areas were segregated from production areas and the architectural features of Muthanna buildings copied where appropriate. The plan for the new facility at Al Hakam envisaged research and development, production and storage of biological warfare agents, but not munitions filling. Construction of the production buildings at the northern end of the Al Hakam site was largely complete by September 1988 after which work commenced on erection of the laboratory buildings;

(i) In 1988, a search for production equipment for the biological weapons programme was conducted in Iraq. Two 1,850-litre and seven 1,480-litre fermenters from the Veterinary Research Laboratories were transferred to Al Hakam in November 1988. The 450-litre fermenter line at Taji, which was at the time used in the production of botulinum toxin, was also earmarked for transfer to Al Hakam and was relocated there in October 1988. From mid-1988, large fermenters were also sought from abroad, but after Iraq completed a contract for a 5,000-litre fermenter, an export licence was not granted;

(j) At Al Hakam, production of botulinum toxin for weapons purposes began in April 1989 and anthrax in May 1989. Initially much of the fermentation capacity for anthrax was used for the production of anthrax simulant for weapons field trials. Production of anthrax itself, it is claimed, began in earnest in 1990. In total, about 6,000 litres of concentrated botulinum toxin and 8,425 litres of anthrax were produced at Al Hakam during 1990;

(k) From the early period of the biological weapons programme at Al Salman, there was interest in other potential biological warfare agents beyond anthrax and botulinum toxin. It became the policy to expand the biological weapons programme into these other fields. Thus, from the design phase of Al Hakam as a biological weapons research, production and storage facility, there were plans for such diversification, including facilities to work on viruses and laboratory space for genetic engineering studies;

(l) In April 1988, in addition to anthrax and botulinum toxin, a new agent, Clostridium perfringens (gas gangrene), was added to the bacterial research work at Al Salman. (Clostridium perfringens produces a condition known as gas gangrene, so named because of the production of gaseous rotting of flesh, common in war casualties requiring amputation of limbs.) In August 1989, work on perfringens was transferred from Al Salman to Al Hakam;

(m) In May 1988, studies were said to be initiated at Al Salman on aflatoxin. (Aflatoxin is a toxin commonly associated with fungal-contaminated food grains and is known for its induction of liver cancers. It is generally considered to be non-lethal in humans but of serious medical concern because of its carcinogenic activity.) Later research was also done on trichothecene mycotoxins such as T-2 and DAS. (Tricothecene mycotoxins produce nausea, vomiting, diarrhoea and skin irritation and, unlike most microbial toxins, can be absorbed through the skin.) Research was conducted into the toxic effects of aflatoxins as biological warfare agents and their effect when combined with other chemicals. Aflatoxin was produced by the growth of the fungus aspergillus in 5-litre flasks at Al Salman;

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(n) In 1989, it was decided to move aflatoxin production for biological weapons purposes to a facility at Fudaliyah. The facility was used for aflatoxin production in flasks from April/May 1990 to December 1990. A total of about 1,850 litres of toxin in solution was declared as having been produced at Fudaliyah;

(o) Another fungal agent examined by Iraq for its biological weapons potential was wheat cover smut. (Wheat cover smut produces a black growth on wheat and other cereal grains; contaminated grain cannot be used as foodstuff.) After small production at Al Salman, larger-scale production was carried out near Mosul in 1987 and 1988 and considerable quantities of contaminated grain were harvested. The idea was said not to have been further developed; however, it was only sometime in 1990 that the contaminated grain was destroyed by burning at the Fudaliyah site;

(p) Another toxin worked for weapons application was ricin. (Ricin is a protein toxin derived from castor bean plants that is highly lethal to humans and animals. When inhaled, ricin produces a severe diffuse breakdown of lung tissue resulting in a haemorrhagic pneumonia and death.) It appears that work started in 1988 at Al Salman. The first samples of ricin were supplied from the Sammarra drug factory and after some initial toxicological tests in conjunction with Muthanna, the quantity required for a weapons test was determined. Ten litres of concentrated ricin were prepared. A weapons trial was conducted with the assistance of Muthanna using artillery shells. The test was considered to be a failure. The project was said to have been abandoned after this;

(q) Work on virus for biological weapons purposes started at Al Salman in July 1990. Shortly thereafter, a decision was taken to acquire the Foot and Mouth Disease facility at Daura and it was taken over for biological weapons purposes, in addition to the continued production of vaccines. It was decided that the Daura plant within the biological weapons programme would include facilities for bacteriology, virology and genetic engineering. Three viral agents for the biological weapons programme were obtained from within Iraq: haemorrhagic conjunctivitis virus, a rotavirus and camel pox virus. (Haemorrhagic conjunctivitis is an acute disease that causes extreme pain and temporary blindness. Rotavirus causes acute diarrhoea that could lead to dehydration and death. Camel pox causes fever and skin rash in camels; infection of humans is rare.) It was stated that very little work had been done on these viruses and none had been produced in quantity;

(r) Early in 1988, efforts began in the weaponization of biological warfare agents and some of the senior scientists involved in the biological weapons programme at TRC were sent to Iraq's munitions factories to familiarize themselves with this aspect. At about the same time, TRC first discussed with the Muthanna State Establishment weaponization of biological warfare agents and it was agreed that, because of Muthanna's experience in the weaponization of chemical agents, the Establishment would also provide the necessary assistance for the selection of weapons types for warfare agents and the conduct of field trials;

(s) The first field trials of biological weapons were said to have been conducted in March 1988 at Muthanna's weapons test range, Muhammadiyat. Two

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tests were done on the same day, one using the anthrax simulant, Bacillus subtilis, and the other using botulinum toxin. The munitions chosen for the tests were aerial bombs positioned on adjacent stands. The effects were observed on test animals (for botulinum toxin) or on Petri dishes (for subtilis). The first tests of both agents were considered failures. The agents in both cases did not spread far enough. Later in March, the second field trial with the same weapons systems was said to have been conducted and it was considered successful;

(t) No further weapons field trials were claimed to have been carried out for the next 18 months. In November 1989, further weaponization trials for anthrax (again using subtilis), botulinum toxin and aflatoxin were conducted, this time using 122 mm rockets, again at Muhammadiyat. These tests were also considered a success. Live firings of filled 122 mm rockets with the same agents were carried out in May 1990. Trials of R400 aerial bombs with Bacillus subtilis were first conducted in mid-August 1990. Final R400 trials using subtilis, botulinum toxin and aflatoxin followed in late August 1990;

(u) After 2 August 1990, the date of Iraq's invasion of Kuwait, Iraq's biological weapons programme was drastically intensified: the emphasis was shifted to production and later to weaponization of produced biological warfare agents. The foot and mouth disease plant at Daura was converted to biological weapons production. The six vaccine fermenters with ancillary equipment at the plant were used for production of botulinum toxin from November 1990 until 15 January 1991, by which time about 5,400 litres of concentrated toxin had been produced. It was decided that there was an additional requirement for anthrax production and the fermenters at Al Hakam that had been previously used for the production of botulinum toxin there were modified to meet the requirements for increased anthrax production. Production of perfringens for biological weapons purposes also began at Al Hakam in August 1990 using the 150-litre fermenter which had been relocated from Al Salman. A total of 340 litres of concentrated perfringens was produced;

(v) In December 1990, a programme was initiated to develop an additional delivery means, a biological weapons spray tank based on a modified aircraft drop tank. The concept was that tanks would be fitted either to a piloted fighter or to a remotely piloted aircraft to spray up to 2,000 litres of anthrax over a target. The field trials for both the spray tank and the remotely piloted vehicle were conducted in January 1991. The test was considered a failure and no further effort towards further development was said to have been made. Nevertheless, three additional drop tanks were modified and stored, ready for use. They are said to have been destroyed in July 1991. The prototype spray tank used for trials was claimed to have been destroyed during the Gulf war bombing;

(w) Weaponization of biological warfare agents began on a large scale in December 1990 at Muthanna. As declared, the R400 bombs were selected as the appropriate munition for aerial delivery and 100 were filled with botulinum toxin, 50 with anthrax and 16 with aflatoxin. In addition, 25 Al Hussein warheads, which had been produced in a special production run since August 1990, were filled with botulinum toxin (13), anthrax (10) and aflatoxin (2). These weapons were then deployed in early January 1991 at four locations, where they remained throughout the war;

(x) In summary, Iraq has declared the production of at least 19,000 litres of concentrated botulinum toxin (nearly 10,000 litres were filled into munitions), 8,500 litres of concentrated anthrax (some 6,500 litres were filled into munitions) and 2,200 litres of concentrated aflatoxin (1,580 litres were filled into munitions);

(y) Iraq declared that it had decided to destroy biological munitions and the remaining biological warfare bulk agent after the Gulf war. An order for destruction was claimed to have been given orally, and no Iraqi representative seems to be able to recall an exact date for the order or the dates of destruction operations. The order was said to have been given some time in May or June 1991. All filled biological bombs were relocated to one airfield and deactivation chemicals added to agent fill. The bombs were then explosively destroyed and burnt, and the remains buried. A similar disposal technique was used for the missile warheads at a separate site. In late August 1995, Iraq showed to an UNSCOM team a location which it claimed to be a warhead destruction site. However, later on, Iraq changed its story and was unable to identify with any degree of certainty the exact location of warheads destruction operations;

(z) Of the bacterial bulk agent stored at Al Hakam, Iraq stated that a similar deactivation procedure had been adopted. The detoxified liquid was emptied into the facility's septic tank and eventually dumped at the site. About 8,000 litres of concentrated botulinum toxin, over 2,000 litres of concentrated anthrax, 340 litres of concentrated perfringens and an unspecified quantity of aflatoxin, according to Iraq's declaration, were destroyed at Al Hakam.

76. Iraq's biological weapons programme as described to the Commission embraced a comprehensive range of agents and munitions. Agents under Iraq's biological weapons programme included lethal agents, e.g. anthrax, botulinum toxin and ricin, and incapacitating agents, e.g. aflatoxin, mycotoxins, haemorrhagic conjunctivitis virus and rotavirus. The scope of biological warfare agents worked on by Iraq encompassed both anti-personnel and anti-plant weapons. The programme covered a whole variety of biological weapons delivery means, from tactical weapons (e.g. 122 mm rockets and artillery shells), to strategic weapons (e.g. aerial bombs and Al Hussein warheads filled with anthrax, botulinum toxin and aflatoxin) and "economic" weapons, e.g. wheat cover smut. Given the Iraqi claim that only five years had elapsed since its declared inception in 1985, the achievements of Iraq's biological weapons programme were remarkable.

77. The achievements included the production and actual weaponization of large quantities of bacterial agents and aflatoxin and research on a variety of other biological weapons agents. A special dedicated facility, Al Hakam, for biological weapons research and development as well as large-scale production was under construction, with most essential elements completed at the time of the Gulf war and production and storage capabilities operational. A number of other facilities and establishments in Iraq provided active support for the biological weapons programme. The programme appears to have a degree of balance

suggesting a high level of management and planning that envisioned the inclusion of all aspects of a biological weapons programme, from research to weaponization. It is also reasonable to assume that, given that biological weapons were considered as strategic weapons and were actually deployed, detailed thought must have been given to the doctrine of operational use for these weapons of mass destruction.

78. It appears that, until August 1990, the biological weapons programme had been developing at a steady pace, continuing to expand and diversify. In August 1990, a "crash" programme was launched and the imperatives of production and weaponization took over.

79. The documentation on Iraq's biological weapons programme obtained by the Commission in August 1995 appears to represent a fraction of all the documents generated under the programme. For example, studies were described orally by Iraq to the Commission that are not included in any of the documentation. Some of the studies referred to in the documents differ significantly from those described to the Commission. Information available to the Commission from other sources does not correspond in important aspects to the information provided by Iraq.

80. In spite of the substantial new disclosures made by Iraq since mid-August, the Commission does not believe that Iraq has given a full and correct account of its biological weapons programme. The Commission intends to continue its intensive inspection, verification and analytical efforts with the objective of presenting to the Security Council, as soon as possible, its assessments of Iraq's compliance with the biological weapons-related provisions of Security Council resolution 687 (1991). Success will depend on Iraq's cooperation with these efforts and its complete openness, including provision to the Commission of all documentation and of a truly full, final and complete disclosure of Iraq's proscribed biological weapons programme.

VI. NUCLEAR ACTIVITIES

81. The Director General of IAEA is reporting separately on the activities of the UNSC 687 Action Team set up to implement paragraphs 12 and 13 of Security Council resolution 687 (1991) and the IAEA plan for ongoing monitoring and verification approved under resolution 715 (1991) (S/22872/Rev.1 and Corr.1).

82. The Special Commission continues, in accordance with paragraph 9 (b) (iii) of resolution 687 (1991) and paragraph 4 (b) of resolution 715 (1991), to provide its assistance and cooperation to the IAEA Action Team through the provision of special expertise and logistical, informational and other operational support for the carrying out of the IAEA plan for ongoing monitoring and verification. In accordance with paragraph 9 (b) (i) of resolution 687 (1991) and paragraph 4 (a) of resolution 715 (1991), it designates sites for inspection. In accordance with paragraph 3 (iii) of resolution 707 (1991), it decides on requests from Iraq to move or destroy any material or equipment relating to its nuclear weapons programme or other nuclear activities. Furthermore, it continues, in accordance with paragraph 4 (c) of resolution 715 (1991), to perform such other functions, in cooperation in the nuclear field

with the Director General of IAEA, as may be necessary to coordinate activities under the plans for ongoing monitoring and verification, including making use of commonly available services and information to the fullest extent possible, in order to achieve maximum efficiency and optimum use of resources.

83. During the current reporting period, the Commission has reviewed and concurred with a number of IAEA evaluations of Iraqi requests to relocate materials and equipment within Iraq, participated with IAEA teams during routine inspections, provided, through the German Government, fixed-wing (C-160) and rotating-wing (CH-53G) aircraft for the transport of IAEA inspectors into Iraq from Bahrain and between points within Iraq and provided the UNSC 687 Action Team with working room and supporting facilities at the Baghdad Monitoring and Verification Centre.

84. Close coordination between IAEA and the Commission is already ongoing in the management and control of machine tool movements within Iraq, and a better integration between the IAEA and UNSCOM systems of survey has been implemented, for example for machines located at the Nassr State Establishment, which are under both missile and nuclear monitoring. Cross-disciplinary inspections have been more frequent in order to increase the information flow and develop cross-fertilization between the specialized teams. IAEA and the Commission also cooperated in the initial assessment of the documents obtained in Iraq on 20 August 1995.

85. The Commission's nuclear experts will participate in certain inspections decided by the Action Team during the coming months. Regular meetings are now scheduled, alternatively in New York and Vienna, to exchange information from all sources and to plan cross-disciplinary inspections. Commission experts regularly visit Vienna to update the IAEA photo library. The Commission's experts are continuing to participate in IAEA's negotiations with the Russian Federation regarding the sale of the nuclear materials removed from Iraq and reprocessed in Russia.

VII. OTHER ACTIVITIES

A. Export/import mechanism

86. As mentioned in the April 1995 report, the joint proposal prepared by the Special Commission and IAEA for the export/import mechanism called for in paragraph 7 of Security Council resolution 715 (1991) was submitted to the Sanctions Committee in February 1995. Upon receipt of the concurrence of that Committee, it is to be transmitted to the Council for its approval.

87. In the course of the consideration of the proposal by the Sanctions Committee, certain delegations requested information on the modalities which would be followed by the Special Commission and IAEA when implementing the mechanism in Iraq. On 17 July 1995, the Executive Chairman of the Commission sent a letter to the Chairman of the Sanctions Committee responding to this request. In that letter, the Chairman pointed out that the Security Council had on several occasions confirmed that the sole responsibility for carrying out their mandates in Iraq rested with the Commission and IAEA. Nevertheless, the

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Commission and IAEA had kept the Council fully informed of their activities and their modus operandi. In keeping with that practice, it was useful to indicate the general principles which would be followed in implementing the mechanism in Iraq.

88. In his letter, the Executive Chairman explained that an office of export/import specialists would be established in the Baghdad Monitoring and Verification Centre which would serve as an administrative clearing house for communications from Iraq regarding the notification forms which it would be required to submit. That office and the Centre would also implement inspections within Iraq to ensure that the mechanism was being complied with. These inspections would be as vigorous as necessary to ensure that no violations of the export/import regime would occur. In this regard, the Commission and the IAEA intended to rely on their full rights under the relevant Security Council resolutions (including resolutions 687 (1991), 707 (1991) and 715 (1991), the plans for ongoing monitoring and verification (S/22871/Rev.1 and S/22872/Rev.1 and Corr.1), the privileges and immunities as set forth in the exchange of letters between the United Nations and Iraq of 6 and 17 May 1991 and the decision to be taken by the Security Council approving the mechanism.

89. The letter further stated that inspections under the mechanism would take place not only at the declared end-user sites where notified items would be tagged, as appropriate, and entered into the site protocols, but would also be conducted anywhere else in Iraq, including points of entry into Iraq, where there was reason to believe that notified items or dual-use items in respect of which there should have been notification might be found. To ensure Iraqi compliance the monitoring activities would be carried out in whatever ways yielded the most effective results, whether by monitoring end-user sites, or border crossings, or other locations.

90. The Executive Chairman proposed, when the Sanctions Committee was in a position to forward the proposal for the mechanism to the Security Council, as the tripartite proposal called for in paragraph 7 of resolution 715 (1991), that it should be accompanied, for purposes of information, by his letter setting out in general terms the modalities which it was intended would be followed in implementing the mechanism.

91. On 20 July 1995, the Sanctions Committee resumed consideration of the Special Commission's and IAEA's joint proposal for the export/import mechanism, together with the Executive Chairman's letter of 17 July. The Committee approved the proposal and the suggestion of the Executive Chairman that its transmission to the Council should be accompanied by the letter of 17 July. Because of a request, formal transmission to the Council has been postponed. Transmission is expected to take place as soon as all members indicate the concurrence of their Governments.

92. In the meantime, the Special Commission has continued its efforts to prepare for the implementation of the mechanism after its adoption by the Security Council so as to be able to put it into effect as of such time as the Council directs.

B. National implementation measures

93. There have been no new developments since the Commission's reports in April and June 1995 regarding the national implementation measures which Iraq is required to take under the plans for ongoing monitoring and verification. The Commission has continued to pursue the matter and to press for the adoption of the necessary legislation. On each occasion that the matter has been raised, the Iraqi representatives have stated that the legislation is with the Office of the Presidency and that no problems were foreseen in its adoption. Assurances that such adoption would be forthcoming in a matter of days or weeks have not been fulfilled. The absence of this legislation, almost four years after the adoption of resolution 715 (1991) approving the plans for ongoing monitoring and verification, is of great concern to the Commission. There is no doubt that the enactment of this legislation, inter alia, prohibiting Iraqi citizens from engaging in activities proscribed by resolution 687 (1991), would be regarded as an indication of Iraq's will to comply fully with the requirements of the resolution.

C. Aerial surveillance

94. The aerial imagery provided by the Commission's high-altitude surveillance aircraft (U-2) and the Baghdad-based aerial inspection team continues to be an essential tool for the monitoring regime and for the investigation of new sites. To date, over 600 missions have been undertaken by the aerial inspection team and 269 missions by the U-2.

95. The establishment of the photographic development laboratory in the Monitoring Centre in Baghdad has facilitated the swift processing and review of the aerial photographic product. The capability to process photography at the Centre has also proved a useful asset for ground inspection teams.

VIII. FINANCE, ORGANIZATION AND AIR SUPPORT

96. The financial situation of the Special Commission is more precarious than ever. Funds, either from frozen Iraqi assets or provided as contributions to the Commission, have been trickling into the escrow account established under Security Council resolution 778 (1992) on a very irregular basis. While funding has been secured for the remainder of 1995, funds have yet to be identified for 1996. The level of operational expenditures of the Commission from its inception in May 1991 until the end of 1995 will have reached $100 million. The operational budget of the Commission, under the current rate of activities, will be around $20 million for the next year.

97. The above figures only reflect the operational budget of the Commission, which has greatly benefited from the assistance of supporting Governments through the direct provision of services, staff and equipment. Such Governments may seek reimbursement when adequate funds are obtained from Iraq, which has responsibility for all costs incurred under section C of Security Council resolution 687 (1991).

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98. The number of the Special Commission's experts in New York has been increased over the last few months to cope with the growing workload. All additional experts have been provided by Member States at their own cost.

99. The Commission is strengthening its communications system between New York and Baghdad and is acquiring an improved voice and fax data system which will enable the transmission of data in a highly secure manner.

100. The office space situation of the Commission in New York is becoming more difficult. It will be impossible to accommodate, within the currently available space, the additional documents obtained in August which are now arriving in New York. A special request has been made for additional secure space for this purpose.

101. The Commission has described the establishment, preparations and resources of the Baghdad Monitoring and Verification Centre in earlier reports (S/1994/1138 and S/1995/284). All the projects planned to renovate the Canal Hotel facilities for the Centre, in part using Iraqi labour and materials, are now completed. This effort has taken up much of the last year and could not have been finished without the generous contributions of personnel, equipment and materials from supporting States.

102. The field office in Bahrain continues to support the operations of the Commission and the activities of the Baghdad Monitoring and Verification Centre. The Commission wishes to place on record its gratitude to the Government of Bahrain for its great generosity and unstinting support in the establishment and maintenance of the field office in Bahrain. This has constituted one of the most important contributions to the work of the Commission and has considerably expedited that work.

103. Recently, the Secretary-General noted the substantial contributions of air support from the Government of Germany for the operations of the Special Commission and IAEA in Iraq (A/50/1, para. 701). Indeed, without the C-160 transport aircraft and the CH-53G helicopters, the Commission would not have accomplished its work and could not meet the requirements of the Security Council in carrying out ongoing monitoring and verification and its other responsibilities in Iraq.

104. The airlift support provided by Germany has been of the highest quality. One measure of the success of this effort is that the helicopter unit recently achieved 3,000 accident-free flying hours in Iraq under the difficult and complex flight conditions existing there. The C-160 Transall aircraft has flown over 10,000 passengers into and out of Iraq. Another measure is the outstanding logistical support from the contributing Government to its forward-deployed units in Bahrain and in Iraq. Air support will continue to be critical to Commission and IAEA operations in Iraq.

105. Helicopter support in Iraq has been and will continue to be vital for the independence of the operations of the Commission and IAEA. Indeed, with the lifting of sanctions and the resumption of international trade, the requirement for helicopter support will increase significantly. Helicopters will provide efficient transportation for inspection teams to travel to border crossings and

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points of entry. At the same time, the current requirements will remain for low-altitude aerial inspection photography; medical evacuation; rapid, no-notice movement of inspection teams; and airlift for vehicles. These many needs are met with the CH-53G, which appears to be the most efficient aircraft currently available for this purpose. The Commission remains profoundly grateful to the Government of Germany for its unique and vital contribution in carrying out the Security Council's mandate in Iraq under section C of Security Council resolution 687 (1991).

IX. CONCLUSION

106. During the period under review and since the Special Commission's report in June 1995, very important developments have taken place in all areas, and a considerable amount of information has become available to the Commission concerning Iraq's proscribed programmes. The Commission's preliminary analysis of this information reveals that Iraq has been concealing proscribed activities and that, consequently, some of the assessments in the Commission's earlier reports have to be revised.

107. Iraq has been misleading the Commission by withholding information that, before the Gulf war, it had secretly produced Scud-type missile engines and carried out research and development on a variety of projects on missiles of prohibited ranges. Furthermore, Iraq's efforts to conceal its biological weapons programme, its chemical missile warhead flight tests and work on the development of a missile for the delivery of a nuclear device led it to provide incorrect information concerning certain of its missile activities. The new revelations cast into doubt the veracity of Iraq's previous declarations in the missile area, including the material balance for proscribed weapons and items. Consequently, Iraq has agreed to provide a new declaration with a full, final and complete disclosure in the missile area.

108. In the chemical weapons area, the Special Commission's investigations have led to disclosure of activities aiming at the acquisition of a considerable capability for the production of the advanced nerve agent VX. Whether Iraq still keeps precursors in storage for immediate VX use has not been fully clarified. The revelations also shed new light on the scope and ambition of Iraq's chemical weapons programme. The Commission must adjust the direction of some of its monitoring activities, especially to prevent Iraq from using its chemical compounds, equipment and activities for secret acquisition of chemical weapons. Further destruction of some Iraqi chemical assets has to be contemplated. The Commission has requested Iraq to provide a new declaration comprising a full, final and complete disclosure of its capabilities with regard to chemical weapons.

109. The Special Commission has detected and identified a hitherto secret offensive biological weapons programme in Iraq comprising a large-scale production of biological warfare agents, the filling and deployment of missile warheads and aerial bombs with agents, as well as biological weapons research and development activities of considerable width and depth. As late as August of this year, Iraq presented to the Commission a formal, but essentially false, declaration on its biological weapons activities. Consequently, the Commission

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has requested again and - Iraq has agreed to provide - a full, final and complete disclosure of its biological weapons programme in the form of a new declaration. Much remains to be verified with regard to these weapons, in particular the destruction of munitions and bulk agents.

110. Given the new disclosures, the Special Commission is obliged to consider, in accordance with paragraph 8 of Security Council resolution 687 (1991), the possible destruction of facilities and items which were used in the production of biological weapons.

111. For the fulfilment of the Special Commission's tasks, it needs a complete understanding of the concept behind each stage of the development of all proscribed weapons. A special concern of the Commission in this respect is the matter of the deployment of Iraq's proscribed missiles with non-conventional warheads for strategic and offensive use.

112. The increased flow of data, whether originating in Iraq's new admissions or in recently obtained documents and other types of documentation, has opened up new possibilities for a solid and credible account of the proscribed weapons and weapons capabilities. With these new developments, the prospects for the full implementation of the weapons chapter of Security Council resolution 687 (1991) have improved.

113. Further exploration and investigation are necessary to verify that Iraq's new statements and the declarations in all the weapons areas requested by the Commission are true representations of the facts. The large amount of documentation obtained will be of use in this regard. The Special Commission will concentrate its personnel and technical resources in order to achieve a complete and reliable account as fast as possible.

114. The system for ongoing monitoring and verification is now in place and has been tested for some time. It is as much in the interests of Iraq as of the Commission that the ongoing monitoring and verification system functions without any flaws. Even if the new revelations have led to adjustments, redirection and augmentation of activities, the system has already proved to be robust and fundamentally sound. Indeed, it was during the build-up of the monitoring structures that the Commission's scientists and analysts were able to detect Iraq's concealment of its hitherto secret biological weapons programme. Likewise, as mentioned above, Iraqi efforts to circumvent the control arrangements in the missile and chemical areas have been detected before any serious damage has occurred. The Commission also detected undeclared efforts by Iraq to establish a covert procurement network for activities under monitoring.

115. In this report, the Commission has outlined its concerns in all areas of its responsibility. Questions can still be raised about the intentions of Iraq as regards possible remnants of its proscribed programmes. In the coming months, the Government of Iraq must present three new declarations comprising full, final and complete disclosures of all its proscribed capabilities. Iraq must at the same time hand over the weapons documentation still in its hands. Access to and control of all relevant documentary evidence is necessary for the Commission to be able quickly and effectively to verify Iraq's declarations and ascertain that all Iraq's proscribed weapons capabilities have indeed been

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disposed of. If the requested declarations and actions by Iraq fulfil the requirements of the Security Council, a solid base will be laid for the full implementation of all aspects of section C of Security Council resolution 687 (1991). With an effective and proven monitoring and verification system in place, the Commission should be able to confirm that Iraq would have no capability to project any threat with proscribed weapons against its neighbours.

116. A necessary prerequisite for a comprehensive solution is that Iraq demonstrate a full openness and a manifest willingness to cooperate in all its dealings with the Special Commission. Iraq's stated preparedness to provide such cooperation is a hopeful sign. The true character of Iraq's expressed political intent will soon be tested by the Commission in its inspections and analytical activity. If Iraq were genuinely to translate its statements into action, there would be a real hope for the completion of the task entrusted to the Special Commission within a reasonable time-frame.

APPENDIX

Inspection schedule

(in-country dates)

Nuclear

15 May-21 May 1991	IAEA 1/UNSCOM 1
22 June-3 July 1991	IAEA 2/UNSCOM 4
7 July-18 July 1991	IAEA 3/UNSCOM 5
27 July-10 August 1991	IAEA 4/UNSCOM 6
14 September-20 September 1991	IAEA 5/UNSCOM 14
21 September-30 September 1991	IAEA 6/UNSCOM 16
11 October-22 October 1991	IAEA 7/UNSCOM 19
11 November-18 November 1991	IAEA 8/UNSCOM 22
11 January-14 January 1992	IAEA 9/UNSCOM 25
5 February-13 February 1992	IAEA 10/UNSCOM 27
7 April-15 April 1992	IAEA 11/UNSCOM 33
26 May-4 June 1992	IAEA 12/UNSCOM 37
14 July-21 July 1992	IAEA 13/UNSCOM 41
31 August-7 September 1992	IAEA 14/UNSCOM 43
8 November-19 November 1992	IAEA 15/UNSCOM 46
6 December-14 December 1992	IAEA 16/UNSCOM 47
22 January-27 January 1993	IAEA 17/UNSCOM 49
3 March-11 March 1993	IAEA 18/UNSCOM 52
30 April-7 May 1993	IAEA 19/UNSCOM 56
25 June-30 June 1993	IAEA 20/UNSCOM 55
23 July-25 July 1993	IAEA 21/UNSCOM 61
1 November-9 November 1993	IAEA 22/UNSCOM 64
4 February-11 February 1994	IAEA 23/UNSCOM 65
11 April-22 April 1994	IAEA 24/UNSCOM 73
21 June-1 July 1994	IAEA 25/UNSCOM 53
22 August-2 September 1994	IAEA 26/UNSCOM 90
7 September-29 September 1994	NMG 94-01
14 October-21 October 1994	IAEA 27/UNSCOM 93
29 September-21 October 1994	NMG 94-02
21 October-9 November 1994	NMG 94-03
8 November-29 November 1994	NMG 94-04
29 November-16 December 1994	NMG 94-05
16 December 1994-13 January 1995	NMG 94-06
12 January-2 February 1995	NMG 95-01
2 February-28 February 1995	NMG 95-02
28 February-16 March 1995	NMG 95-03
16 March-6 April 1995	NMG 95-04
6 April-26 April 1995	NMG 95-05
27 April-10 May 1995	NMG 95-06
11 May-30 May 1995	NMG 95-07
31 May-20 June 1995	NMG 95-08
21 June-9 July 1995	NMG 95-09
10 July-30 July 1995	NMG 95-10
31 July-10 August 1995	NMG 95-11
11 August-29 August 1995	NMG 95-12

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30 August-11 September 1995	NMG 95-13	
9 September-19 September 1995	IAEA 28/UNSCOM	131
12 September-3 October 1995	NMG 95-14	
4 October 1995-	NMG 95-15	

Chemical

9 June-15 June 1991	CW 1/UNSCOM	2
15 August-22 August 1991	CW 2/UNSCOM	9
31 August-8 September 1991	CW 3/UNSCOM	11
31 August-5 September 1991	CW 4/UNSCOM	12
6 October-9 November 1991	CW 5/UNSCOM	17
22 October-2 November 1991	CW 6/UNSCOM	20
18 November-1 December 1991	CBW 1/UNSCOM	21
27 January-5 February 1992	CW 7/UNSCOM	26
21 February-24 March 1992	CD 1/UNSCOM	29
5 April-13 April 1992	CD 2/UNSCOM	32
15 April-29 April 1992	CW 8/UNSCOM	35
18 June 1992-14 June 1994	CDG / UNSCOM	38
26 June-10 July 1992	CBW 2/UNSCOM	39
21 September-29 September 1992	CW 9/UNSCOM	44
6 December-14 December 1992	CBW 3/UNSCOM	47
6 April-18 April 1993	CW 10/UNSCOM	55
27 June-30 June 1993	CW 11/UNSCOM	59
19 November-22 November 1993	CW 12/UNSCOM	65
1 February-14 February 1994	CW 13/UNSCOM	67
20 March-26 March 1994	CW 14/UNSCOM	70
18 April-22 April 1994	CW 15/UNSCOM	74
25 May-5 June 1994	CW 16/UNSCOM	75
31 May-12 June 1994	CW 17/UNSCOM	76
8 June-14 June 1994	CW 18/UNSCOM	77
10 August-23 August 1994	CW 19/UNSCOM	89
13 September-24 September 1994	CW 20/UNSCOM	91
2 October 1994-14 January 1995	CG 1	
23 October-27 October 1994	CW 21/UNSCOM	95
11 January-21 January 1995	CW 23/UNSCOM	108
16 January-22 January 1995	CW 22/UNSCOM	107
14 January-15 April 1995	CG 2	
16 April-26 September 1995	CG 3	
16 September-20 September 1995	CW 25/UNSCOM	124
27 September 1995-	CG 4	

Biological

2 August-8 August 1991	BW 1/UNSCOM	7
20 September-3 October 1991	BW 2/UNSCOM	15
11 March-18 March 1993	BW 3/UNSCOM	53
8 April-26 April 1994	BW 4/UNSCOM	72
28 May-7 June 1994	BW 5/UNSCOM	78
24 June-5 July 1994	BW 6/UNSCOM	84
5 June-8 June 1994	BW 7/UNSCOM	86
25 July-7 September 1994	BW 8/UNSCOM	87

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20	August-25 August 1994	BW 9/UNSCOM	88	
29	August-3 September 1994	BW 10/UNSCOM	92	
29	September-14 October 1994	BW 11/UNSCOM	94	
23	September-26 September 1994	BW 12/UNSCOM	96	
15	November-22 November 1994	BW 15/UNSCOM	104	
2	December-10 December 1994	BW 16/UNSCOM	105	(IMT)
2	December-13 December 1994	BW 13/UNSCOM	99	(IMT)
9	December-16 December 1994	BW 17/UNSCOM	106	(IMT)
28	December 1994-31 January 1995	IBG 1		
10	January-22 January 1995	BW 18/UNSCOM	109	
20	January-6 February 1995	BW 19/UNSCOM	110	
23	January-3 February 1995	BW 22/UNSCOM	113	
3	February-17 February1995	BW 20/UNSCOM	111	
3	February-17 February 1995	BW 21/UNSCOM	112	
12	March-18 March 1995	BW 23/UNSCOM	115	
24	March-6 April 1995	BW 24/UNSCOM	116	
1	February-3 April 1995	IBG 2		
4	April-7 August 1995	BG 1		
27	April-16 May 1995	BW 25/UNSCOM	118	
15	July-26 July 1995	BW 26/UNSCOM	121	
19	August-3 September 1995	BW 27/UNSCOM	125	
27	September-11 October 1995	BW 28/UNSCOM	126	
8	August 1995-	BG2		

Ballistic missiles

30	June-7 July 1991	BM 1/UNSCOM	3
18	July-20 July 1991	BM 2/UNSCOM	10
8	August-15 August 1991	BM 3/UNSCOM	8
6	September-13 September 1991	BM 4/UNSCOM	13
1	October-9 October 1991	BM 5/UNSCOM	18
1	December-9 December 1991	BM 6/UNSCOM	23
9	December-17 December 1991	BM 7/UNSCOM	24
21	February-29 February 1992	BM 8/UNSCOM	28
21	March-29 March 1992	BM 9/UNSCOM	31
13	April-21 April 1992	BM 10/UNSCOM	34
14	May-22 May 1992	BM 11/UNSCOM	36
11	July-29 July 1992	BM 12/UNSCOM	40A+B
7	August-18 August 1992	BM 13/UNSCOM	42
16	October-30 October 1992	BM 14/UNSCOM	45
25	January-23 March 1993	IMT1a/UNSCOM	48
12	February-21 February 1993	BM 15/UNSCOM	50
22	February-23 February 1993	BM 16/UNSCOM	51
27	March-17 May 1993	IMT1b/UNSCOM	54
5	June-28 June 1993	IMT1c/UNSCOM	57
10	July-11 July 1993	BM 17/UNSCOM	60
24	August-15 September 1993	BM 18/UNSCOM	62
28	September-1 November 1993	BM 19/UNSCOM	63
21	January-29 January 1994	BM 20/UNSCOM	66
17	February-25 February 1994	BM 21/UNSCOM	69
30	March-20 May 1994	BM 22/UNSCOM	71
20	May-8 June 1994	BM 23/UNSCOM	79

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10 June-24 June 1994	BM 24/UNSCOM 80
14 June-22 June 1994	BM 25/UNSCOM 81
3 July-28 July 1994	BM 26/UNSCOM 82
15 July-24 July 1994	BM 27/UNSCOM 85
17 August-9 October 1994	MG 1
2 October-6 October 1994	BM 28/UNSCOM 98A
23 October-28 October 1994	BM 28/UNSCOM 98B
14 October 1994-21 February 1995	MG 2
19 October-22 October 1994	MG 2A
2 December-6 December 1994	MG 2B
9 December-14 December 1994	BM 29/UNSCOM 101
9 December-16 December 1994	BM 30/UNSCOM 102
27 January-31 January 1995	MG 2C
22 February-30 May 1995	MG 3
6 March-14 March 1995	BM 31/UNSCOM 103
25 May-1 June 1995	BM 32/UNSCOM 100
30 May-27 August 1995	MG 4
25 July-30 July 1995	BM 33/UNSCOM 122
20 August-24 August 1995	MG 4A
27 August 1995-	MG 5
27 September-1 October 1995	BM 34/UNSCOM 123

Computer search

12 February 1992	UNSCOM 30

Export/import mission

22 April - 6 May 1995	UNSCOM 119

Special missions

30 June-3 July 1991
11 August-14 August 1991
4 October-6 October 1991
11 November-15 November 1991
27 January-30 January 1992
21 February-24 February 1992
17 July-19 July 1992
28 July-29 July 1992
6 September-12 September 1992
4 November-9 November 1992
4 November-8 November 1992
12 March-18 March 1993
14 March-20 March 1993
19 April-24 April 1993
4 June-5 July 1993
15 July-19 July 1993
25 July-5 August 1993

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9 August-12 August 1993
10 September-24 September 1993
27 September-1 October 1993
1 October-8 October 1993
5 October-15 February 1993
2 December-10 December 1993
2 December-16 December 1993
21 January-27 January 1994
2 February -6 February 1994
10 April-14 April 1994
24 April-26 April 1994
28 May-29 May 1994
4 July-6 July 1994
8 August-16 August 1994
15 September-19 September 1994
21 September-25 September 1994
23 September-26 September 1994
3 October-6 October 1994
4 November-20 November 1994
7 November-12 November 1994
14 November-17 November 1994
4 December-18 December 1994
14 December-20 December 1994
7 January-31 January 1995
7 January-21 January 1995
13 January-26 January 1995
13 January-16 March 1995
12 January-28 January 1995
23 January-14 February 1995
25 January-4 February 1995
19 February-23 February 1995
22 February-28 February 1995
28 February-18 March 1995
16 March-29 March 1995
24 March-27 March 1995
4 May-23 May 1995
14 May-17 May 1995
29 May-1 June 1995
19 June-22 June 1995
22 June-2 July 1995
30 June-2 July 1995
2 July-10 July 1995
4 August-6 August 1995
7 August-12 August 1995
17 August-20 August 1995
24 August-2 September 1995
24 August-18 September 1995
5 September-14 September 1995
17 September-20 September 1995
29 September-1 October 1995

Senate Permanent Subcommittee on Investigations

EXHIBIT # 9

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THE MATSUMOTO INCIDENT: SARIN POISONING IN A JAPANESE RESIDENTIAL COMMUNITY

KYLE B. OLSON

INTRODUCTION

Late on the evening of June 27, 1994, authorities in Matsumoto, Japan began to receive calls from frightened citizens in Kaichi Heights, a neighborhood near the old heart of the city. Over the next several hours, emergency responders would transfer dozens of persons to area hospitals where they would be treated for acute exposure to toxic chemicals. Doctors were astonished to find dramatically reduced cholinesterase levels in virtually all the victims, and followed a course of treatment for organophosphoric poisoning.

Through the efforts of the medical teams, several very seriously afflicted persons were saved, while others with less severe symptoms received appropriate treatment and were made comfortable. Some cases, however, were beyond help. The toll would ultimately number seven dead and more than 200 injured, with a number of the injured requiring lengthy hospital stays. One survivor suffered permanent and massive brain damage.

Subsequent sampling and analysis identified the presence of the supertoxic nerve gas sarin -- a true chemical weapon -- at several sites in the affected area.

I had the opportunity to visit Matsumoto in December, 1994, for the purpose of collecting information on this case, which has been little reported outside of Japan. The following pages detail my findings, based on interviews with victims, medical personnel, and government officials in Matsumoto. In addition, it reflects information compiled and reported by Japanese sources.

JUNE 27, 1994

Matsumoto is located 100 miles west of Tokyo on the Japanese main island of Honshu. An industrial and tourist city of several hundred thousand people, it sits at the feet of the rugged Japanese Alps. The city is still dominated by the majestic moated castle constructed by a powerful daimyo nearly 400 years ago.

On June 27, between 8:00 PM and midnight, overwhelming evidence indicates sarin gas was released in the Kaichi Heights area. The gas was apparently generated or released from a vacant lot, near a small fishpond. Although no containers or related equipment were found, significant damage to plant life that occurred that evening -- apparently caused by another gas (HF?) released at the same time as the sarin -- radiated from that point. In addition, dead fish found in the pond, and the water and soil in the immediate area, showed traces of sarin.

While the trees around the fish pond and the darkness of night apparently prevented anyone from observing the exact source of the gas, there were several reports of odd, sharp smells. Two witnesses reported seeing a white, mist-like cloud emanate from the area.

CHRONOLOGY

The following is an edited chronology of the events of the evening of June 27, 1994 and the following days:

11:00 PM: A man visiting a friend in the neighborhood suddenly complained of a headache, dizziness, and narrowing of vision.

11:09 PM: A call was received by Matsumoto emergency officials from a man saying that his wife was in pain and asking for an ambulance. The fire department medical team that arrived five minutes later was greeted by the husband, who was disoriented and ill himself. The couple and one of their daughters was transported to Kyoritsu Hospital, the wife receiving CPR from the emergency medical technicians.

11:30 PM: Police were notified by the fire department of the "accident". All officers were placed on alert. There were numerous emergency calls, and many victims were taken to hospitals by ambulance.

12:45 PM: Police used loudspeakers to warn persons of the toxic gases and to close their windows and doors.

1:00 AM: A police officer patrolling the area complained of stinging eyes.

1:20 AM: A shout from the Meiji Life Insurance Co. dormitory summoned help for a collapsed person on the 3rd floor, who ultimately died.

2:45 AM: Twelve out of eighteen persons brought in to Kyoritsu Hospital were hospitalized. Nurses handling the intake of victims, and in close physical proximity to them, subsequently reported having symptoms similar to those of the patients they assisted. Doctors observed physical symptoms of constricted pupils, nausea, and spasms, while blood test revealed severely depleted cholinesterase levels in the persons brought to the hospital. Assuming organophosphoric poisoning of some kind, physicians prescribed atropine injections. Subsequent interviews with doctors also indicated a pattern of excessive salivation (a secondary symptom linked to sarin) by many victims.

4:15 AM: Police announced that six persons had died. Another death was reported later that day.

5:00 AM: Five police officers investigating the scene were taken to Marinouchi Hospital complaining of nausea and stinging eyes.

5:35 AM: Rescuers wearing protective clothing and portable air supplies entered Kaichi Heights.

7:00 AM: Matsumoto police set up a special investigation headquarters to look into the "accident".

10:30 AM: The city established a command post to work out a solution to the poison gas.

11:00 AM: Investigators from the Matsumoto Health Center checked the air and water in Kaichi Heights. Chief Yoko Midorikawa announced that, based on the symptoms of the victims, it appeared the toxic chemical is an organophosphorus compound.

3:00 PM: The Department of Medicine at Shinshu University conducted autopsies on three of the seven dead.

July 3: Local police authorities announced that they had found residual traces of the nerve gas, "sarin", at six different sites in the Kaichi Heights. The identity of the nerve gas was determined through gas chromatography of samples taken in the afflicted neighborhood.

ANALYSIS

Although the events in Matsumoto prompted tremendous media speculation in Japan, the national authorities have publicly deemed the event to be a matter for the local police. There is, however, some reason to believe that considerable investigative activity is taking place within the Japanese intelligence and counter-terrorism establishments. Perhaps out of a desire to prevent panic, Japanese officials have played down the Matsumoto event and avoided speculation -- and even comment -- on the matter.

A better understanding of the threat posed by sarin may help explain why the authorities have apparently decided to downplay the Matsumoto incident.

Sarin is an organophosphorus compound first developed by German scientists during the late 1930's. Although derived from research related to the production of pesticides, it was specifically intended for military use as a chemical weapon. It is one of the most aggressively lethal substances known to chemical science, with an LD_{50} (lethal dose) of less than 0.1 milligram per kilogram. That is, for a typical person of 60 kilograms (132 pounds) weight, a drop containing less than 6 milligrams (approximately 0.0002 ounce) of sarin in contact with the skin will result in death in at least 50% of the cases.

Sarin was produced by combatants on both sides during World War II, but was never used. Although Germany shared the formula for sarin with its Axis partner, Japan, during that conflict, there is no clear evidence that Tokyo ever went ahead with production. Sarin is still present in the arsenals of the United States and Russian Federation, though both countries have pledged to destroy their inventories of all chemical arms by early in the next century.

There are several paths of manufacture for sarin, and these are widely known and documented in the open literature. The compound has no commercial applications, although it is produced from chemicals that are openly available to civilian buyers. Two of the precursor chemicals, hydrogen fluoride and isopropyl alcohol, are produced globally in extremely large volumes. While not exactly easy to make, the synthesis of sarin relies upon widely available technology dating back more than 50 years. The conclusion -- and fear -- of many experts is that nerve gases such as sarin are well within the technical capabilities of developing countries and terrorist groups.

The possibility that Matsumoto may have been the site of such a terrorist use is supported by several factors in the case.

First, sarin is the product of a specific and rather complex series of chemical processes. While well within the capabilities of a technically proficient chemist, the production of sarin is simply not something that can be done by accident. Some of the chemicals used in the manufacture of the gas are both toxic and difficult to obtain, and must be combined in a precise fashion, usually at high temperatures, to produce the nerve gas. The sarin at Matsumoto must have been deliberately formulated.

Second, weather conditions play a major role in the lethality of sarin. Rain both cleans the air of vapors, such as sarin, and neutralizes the nerve agent through hydrolysis; in addition, sarin, a volatile liquid, remains a vapor longer at warmer temperatures. June in Matsumoto is the rainy season, with steady showers and temperatures hovering around 20° C (approx. 68° F). On June 26, the weather changed abruptly. The skies cleared and the temperatures climbed to 30°C (86°F). Forecasters predicted the dry, warm conditions would last until June 28. The sarin poisonings took place on the evening of the second day, suggesting someone anticipated a break in the weather and took advantage of it.

Finally, the apparent absence of hard evidence such as the container used to transport or generate the nerve gas indicates a planned effort to conceal the identity of the person or persons responsible for the act. Initial theories of an experiment gone wrong, or some inadvertent mixing of toxic chemicals foundered as much on the "missing" equipment as on the scientific improbabilities. Possible explanations for the container's absence include that the container was composed of a material that decomposed or melted under the heat of the reaction, that the perpetrator or an accomplice removed the container during the confusion of the emergency response, and that the authorities actually recovered something and are keeping quiet about it.

Arguments against the terrorism theory center on the absence of both a clearly defined target in the Kaichi Heights area (indeed, in all of Matsumoto) and the apparent failure of any person or group to follow-up on the event with the usual trappings of such an action, i.e., messages to the media claiming credit, messages blaming authorities for forcing the attack, threats about another attack, etc. Several possible answers suggest themselves. One of the more compelling is that the Matsumoto attack was essentially an "experiment", designed by the sarin makers to test their technology, their ability to carry off such an assault successfully, and the deadly effectiveness of their weapon. The "experiment" theory may be further supported by reports that an investigation of complaints of headaches and nausea from the inhabitants of a village about an hours drive south of Matsumoto turned up chemicals in the environment authorities acknowledge were likely the degradation products of sarin.

It is not far-fetched to postulate a small group of persons (their motivations being beyond the scope of this paper) carefully testing and evaluating the effectiveness of a weapon based on a technology with which they are unfamiliar. Such testing would be prudent prior to planning a major strike using the new weapons, both to prevent accidents and to assure maximum effectiveness. It may also be that the unknown nature of the hand wielding the weapon plays as part of the group's strategy, or perhaps a desire for optimum surprise and shock. It any case, the person(s) responsible for Matsumoto certainly understand now that a significant quantity of nerve gas, delivered into a warm, crowded urban site (such as a Ginza department store, or major subway station) could have catastrophic consequences.

CONCLUSION

The Matsumoto incident has generally been referred to by authorities and the media in Japan as "the accident". There is compelling evidence that whatever the complete story of that deadly June night turns out to be, the events in that quiet city were anything but accidental. This case deserves further attention as the potential harbinger of the next phase of terrorist horror.

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 13b.

EMBASSY OF AUSTRALIA
WASHINGTON, D. C.

24 October 1995

The Honorable
Senator Sam Nunn
Ranking Minority Member
Permanent Subcommittee on Investigations
United States Senate
WASHINGTON DC 20510-1001

Dear Senator Nunn,

In reply to your request of 5 October, I am pleased to be able to provide a brief (attached) prepared by the Australian Federal Police (AFP) which describes the outcome of their investigation of activities of the Aum Shinrikyo sect in Australia. I expect to forward the annexes referred to in the brief - which presently are coming to the US by diplomatic bag - within the next few days.

You will be aware that the possible use by the sect of chemical weapons on Australian soil has been a matter of grave concern to the Australian Government. This concern endures, even though more recent chemical analysis suggests the situation at the Western Australian station used by the sect may not be as clear cut as the AFP report suggests.

In the wake of the Oklahoma bombing and the Tokyo sarin attack, the Australian Government - like the US Government - has been searching for better means to protect against terrorism, and in particular against the new spectre of chemical weapons (CW) terrorism. CW terrorism is a new phenomenon and fighting it effectively calls for new thinking. One forum Australia has already used, in conjunction with the United States and others, to explore ideas on countering CW terrorism is the Australia Group which reconvened in Paris from 16-19 October. The Australia Group is an informal international body which seeks to counter the proliferation of chemical and biological weapons. Australia also is in the process of conducting an extensive internal investigation of possible national measures to fight CW terrorism.

As a result of consultations both nationally, and internationally in the course of the Australia Group meeting and with a wide range of countries on other occasions, the Australian Government has concluded that the entry into force of the Chemical Weapons Convention (CWC) offers a particularly important opportunity to assist efforts to prevent further chemical weapons terrorism incidents.

The CWC will establish a clear international legal norm against CW. This norm should reinforce the abhorrence widely felt towards such weapons, raising the threshold for any terrorist group thinking of using CW to advance its aims.

And as participation in the CWC regime moves towards universal adherence, the Convention should serve to limit and ultimately prevent any opportunity for terrorist groups to acquire chemical weapons from state sponsors.

The CWC also requires that member governments incorporate in their national law general prohibitions on the development, production or use of chemical weapons. The enactment of such law creates an opportunity to install or reinforce at the national level legal barriers to chemical weapons.

The process of implementing the CWC also will sensitise industry, and other sources of dual-use materials which might be sought by terrorists to make CW, to the risk of misuse of these materials.

Finally, the international organisation responsible for implementing the CWC, the Organisation for the Prohibition of Chemical Weapons - which will be established after the CWC enters into force - will provide a global forum for raising and exploring issues relating to CW terrorism.

I hope the material provided herewith is of assistance to the Senate Permanent Subcommittee on Investigations and that the United States will move soon through ratifying the CWC, to take up the opportunity which I believe the Convention offers to fight CW terrorism.

Yours sincerely

DRussell

Don Russell
Ambassador

THE AUSTRALIAN INVESTIGATION OF THE AUM SHINRIKYO SECT

THE RELEASE OF NERVE GAS ON THE TOKYO SUBWAY IN MARCH THIS YEAR RESULTED IN 12 DEAD AND MORE THAN 5,500 INJURED AND REVEALED THE EXISTENCE OF A JAPANESE DOOMSDAY CULT DEDICATED TO BRINGING ABOUT 'ARMAGEDDON' THROUGH ACTS OF MASS MURDER.

[redacted]

AUM SECT LEADER, CHIZUO MATSUMOTO, OR AS THE WORLD KNOWS HIM, SHOKO ASAHARA, ATTEMPTED TO BRING ABOUT THE END OF THE WORLD BY RECRUITING YOUNG INTELLECTUALS TO DEVELOP WEAPONS OF MASS DESTRUCTION. SECT MEMBERS OPERATED UNDER A MIX OF BUDDHIST BELIEFS OF REINCARNATION AND DELIVERANCE AND WERE OCCUPIED IN LEGITIMATE ENTERPRISES AS WELL AS A RANGE OF CRIMINAL ACTIVITIES INCLUDING MURDER, EXTORTION AND SUBVERSION. THE SECT'S STRUCTURE MIRRORED SOME ASPECTS OF THE JAPANESE GOVERNMENT WHICH THE SECT WAS SET TO REPLACE WHEN IT INSTIGATED THE GOVERNMENT'S DOWNFALL.

[redacted]

THE SECT IN AUSTRALIA

IN APRIL 1993, TWO YEARS BEFORE THE SUBWAY ATTACK, THE SECT'S 'CONSTRUCTION MINISTER', KIYOHIDE HAYAKAWA, AND THE 'INTELLIGENCE MINISTER'. YOSHIHIRO INOUE, ARRIVED IN PERTH, WESTERN AUSTRALIA'S STATE CAPITAL. THEY WERE MET BY AN AUSTRALIAN REALTOR OF JAPANESE ORIGIN. OVER THE FOLLOWING THREE DAYS, THE GROUP FLEW TO SEVERAL SHEEP GRAZING PROPERTIES, KNOWN IN AUSTRALIA AS SHEEP STATIONS, AND INSPECTED THEM AS PROSPECTIVE LOCATIONS TO ESTABLISH A SECT FACILITY. (ANNEX 2)

SECT MEMBERS INDICATED THEY WANTED TO INSPECT REMOTE PROPERTIES WHERE THEY COULD CONDUCT EXPERIMENTS OF BENEFIT TO HUMANKIND, BUT THEY DID NOT DISCLOSE WHAT THE BENEFITS WOULD BE. AFTER LANDING AT EACH STATION, THEY WENT OFF BY THEMSELVES FOR SOME HOURS. AT THE TIME, THEY WERE EQUIPPED WITH PLASTIC BOXES CONTAINING ELECTRONIC TESTING EQUIPMENT TO WHICH PROBES WERE ATTACHED FOR INSERTING INTO THE GROUND. IT IS NOT KNOWN WHAT THIS EQUIPMENT WAS USED FOR DURING THOSE TIMES AWAY FROM THE AIRCRAFT.

AFTER VIEWING SEVERAL PROPERTIES, THE SECT MEMBERS DECIDED TO PURCHASE THE REMOTE BANJAWARN STATION, A SHEEP-GRAZING PROPERTY ABOUT 400 MILES (600 KILOMETRES) NORTH-WEST OF PERTH. THE PROPERTY

[redacted]

THE SECT FORMED TWO AUSTRALIAN COMPANIES, MAHAPOSYA AUSTRALIA PTY LTD AND CLARITY INVESTMENTS PTY LTD. DIRECTORS OF EACH COMPANY WERE MATSUMOTO AND YASUKO SHIMADA, AN AUSTRALIAN CITIZEN OF JAPANESE DESCENT AND SECT MEMBER. MINING EXPLORATION LICENCES FOR BANJAWARN STATION WERE PURCHASED BY BOTH COMPANIES FOR A DOLLARS 150,000 FROM THE WESTERN AUSTRALIA DEPARTMENT OF MINES. IN SEPTEMBER 1993, THE SECT PURCHASED BANJAWARN STATION FOR A DOLLARS 540,000 THROUGH HAYAKAWA, WHO HAD RETURNED TO AUSTRALIA WITH ANOTHER SECT MEMBER TSUYOSHI MAKI.

ON SEPTEMBER 9, 1993, MATSUMOTO AND 24 SECT MEMBERS ARRIVED IN PERTH FROM TOKYO. THE GROUP PAID ABOUT A DOLLARS 30,000 FOR EXCESS BAGGAGE WHICH INCLUDED TOOLS, GENERATORS, DITCH DIGGERS AND PROTECTIVE CLOTHING.INCLUDING GAS MASKS AND RESPIRATORS. CUSTOMS OFFICERS SEARCHED THE BAGGAGE AND FOUND AN ARRAY OF CHEMICALS INCLUDING HYDROCHLORIC AND PERCHLORIC ACIDS. THE HYDROCHLORIC ACID WAS IN LARGE GLASS BOTTLES MARKED ''HAND SOAP''. TWO CRATES OF CHEMICALS AND LABORATORY EQUIPMENT WERE CONFISCATED. (ANNEX 6 AND 7)

AS A RESULT, TWO SECT MEMBERS, SEIICHI ENDO A BIOCHEMIST AND TOMOMASA NAKAGAWA A MEDICAL DOCTOR, WERE CHARGED WITH CARRYING DANGEROUS GOODS ON AN AIRCRAFT. THEY DESCRIBED THEMSELVES AS OFFICE WORKERS ON THEIR VISA APPLICATIONS. EACH WAS SUBSEQUENTLY FINED ADOLLARS 2,400.

AMONG THE GROUP WERE HIDEO MURAI, THE SECT'S 'SCIENCE AND TECHNOLOGY MINISTER', WHO WAS SUBSEQUENTLY MURDERED IN TOKYO ON APRIL 23, 1995. ALSO IN THE GROUP WAS NIIMI TOMOMITSU, THE 'HOME AFFAIRS MINISTER', WHO WAS ARRESTED BY JAPANESE POLICE ON APRIL 12, 1995 ON CHARGES OF FALSE IMPRISONMENT. ANOTHER MEMBER OF THE GROUP WAS THE SECT'S 'INTELLIGENCE MINISTER', YOSHIHIRO INOUE, WHO WAS ARRESTED BY JAPANESE POLICE ON CHARGES RELATED TO THE TOKYO SUBWAY GAS ATTACK.

TRANSPORT LOGISTICS APPEAR TO HAVE BEEN PLANNED WELL IN ADVANCE. SECT MEMBERS CHARTERED THREE AIRCRAFT TO FLY FROM PERTH TO BANJAWARN STATION. A NEW BATCH OF CHEMICALS WAS ORDERED TO REPLACE THOSE SEIZED BY CUSTOMS. ONE SECT MEMBER FLEW FROM WESTERN AUSTRALIA TO MELBOURNE ON THE OTHER SIDE OF THE COUNTRY TO PURCHASE TWO 25 GRAM BOTTLES OF THE CHEMICAL THIOACETAMIDE, VALUED AT ADOLLARS 190 - A RETURN TRIP OF ABOUT 4000 MILES (6000 KILOMETRES).

EIGHT DAYS AFTER ENTERING AUSTRALIA, MATSUMOTO AND THE MAJORITY OF THE GROUP LEFT THE COUNTRY. BY OCTOBER 4, 1993 ALL OF THE REMAINING SECT MEMBERS HAD LEFT AUSTRALIA.

THE AUSTRALIAN FEDERAL POLICE SOUGHT ADVICE FROM THE JAPANESE NATIONAL POLICE AGENCY ABOUT THE SECT. GENERAL VERBAL ADVICE WAS PROVIDED ON THE SECT'S POSSIBLE INVOLVEMENT IN KIDNAPPING IN JAPAN AND PREFECTURAL POLICE WERE INVESTIGATING ALLEGATIONS THAT MEMBERS WANTING TO LEAVE THE SECT WERE BEING UNLAWFULLY DETAINED. IT WOULD APPEAR THAT THE NATIONAL POLICE AGENCY WERE NOT CONVERSANT WITH THE SECT'S INVOLVEMENT IN DOMESTIC TERRORISM OR THE PRODUCTION OF NERVE AGENTS. IT SHOULD ALSO BE NOTED THAT IN JAPAN REGULATION OF RELIGIOUS GROUPS IS COVERED BY LAW.

IN OCTOBER 1993, MATSUMOTO AND FOUR OF THE ORIGINAL GROUP APPLIED FOR VISAS TO RETURN TO AUSTRALIA. THEIR APPLICATIONS, ALONG WITH THOSE OF ANOTHER 12 SECT MEMBERS WERE REJECTED BY THE AUSTRALIAN EMBASSY IN TOKYO. THE CIRCUMSTANCES OF THE GROUP'S ARRIVAL IN AUSTRALIA AND THEIR FAILURE TO OPENLY DISCLOSE THEIR ACTIVITIES AND ANTECEDENTS RAISED A HIGH LEVEL OF SUSPICION IN THE AUSTRALIAN FEDERAL POLICE. THIS WAS BASED ON INFORMATION PROVIDED BY THE AUSTRALIAN FEDERAL POLICE FOLLOWING CONSULTATION WITH THE JAPANESE NATIONAL POLICE AGENCY INVESTIGATIONS AND RESEARCH UNDERTAKEN. TWO SECT MEMBERS AVATOIDED DETECTION BY OBTAINING VISAS FROM THE AUSTRALIAN CONSULATEIN IN OSAKA. THEY TRAVELLED TO AUSTRALIA AND BECAME CARETAKERS FOR THE STATION.

MATSUMOTO WROTE TO THE WESTERN AUSTRALIAN MINISTER FOR MINES AND THE FEDERAL MINISTER FOR IMMIGRATION AND ETHNIC AFFAIRS ASKING THAT THE APPLICATIONS BE RECONSIDERED. IN THE LETTER HE SAID THAT HE WAS BLIND AND NEEDED THE HELP OF TWO AIDS. ALSO, BECAUSE HIS LIFE WAS UNDER THREAT, HE SAID HE NEEDED 17 BODYGUARDS TO ACCOMPANY HIM ON HIS TRIP TO AUSTRALIA. HIS CONCERNS WERE EXPRESSED BY REVELATIONS THAT HIS TOKYO HEADQUARTERS HAD BEEN SPRAYED WITH '' DILUTED HARMFUL GAS'' AND THAT DURING HIS VISIT TO RUSSIA HE HAD RECEIVED BOMB THREATS. (ANNEX 8)

THE INTERNATIONAL COMMUNITY WAS OBLIVIOUS TO THE GLOBAL AND DOMESTIC CRIMINAL ACTIVITIES OF THE SECT. NEWS BROKE THROUGHOUT THE WORLD ON MARCH 20, 1995 THAT THE SECT HAD USED SARIN GAS ON COMMUTERS TRAVELLING IN FIVE TRAINS ON THE TOKYO SUBWAY SYSTEM. TWELVE PEOPLE WERE KILLED AND 5,500 INJURED. THESE TRAINS WERE ROUTED THROUGH KASUMIGASEKI STATION WHICH WAS LOCATED BENEATH THE NATIONAL POLICE AGENCY AND THE TOKYO METROPOLITAN POLICE DEPARTMENT. ELEVEN POUCHES SIMILAR TO THOSE USED FOR BLOOD TRANSFUSIONS OR INTRAVENOUS DRIPS WERE FOUND ON THE TRAINS. THE POUCHES CONTAINED TRACES OF SARIN. IMMEDIATELY AFTER THE ATTACK, SECT LEADER MATSUMOTO WENT INTO HIDING.

SECT ACTIVITIES AT BANJAWARN STATION

AFTER NEWS OF THE SUBWAY ATTACK WAS REPORTED IN AUSTRALIA, THE NEW OWNERS OF BANJAWARN STATION, THROUGH THEIR LAWYER, ALERTED THE AUSTRALIAN FEDERAL POLICE TO SEVERAL UNUSUAL FINDINGS. IMMEDIATELY FEDERAL POLICE OFFICERS FROM PERTH, ACCOMPANIED BY A CHEMIST, RUSHED TO BANJAWARN STATION.

THE SECT HAD ESTABLISHED A LABORATORY IN THE KITCHEN OF AN ABANDONED HOUSE ON THE STATION. THE LABORATORY DOOR WAS MARKED IN JAPANESE HANDWRITING, 'TOYODA LABORATORY'. THIS IS AN OBVIOUS REFERENCE TO TORU TOYODA, A SECT MEMBER WHO ARRIVED IN AUSTRALIA WITH MATSUMOTO.

TOYODA IS A PHYSICS GRADUATE OF TOKYO UNIVERSITY. HE ALSO DESCRIBED HIS OCCUPATION AS ''OFFICE WORKER'' ON HIS AUSTRALIAN VISA

APPLICATION. TOYODA HAS BEEN ARRESTED FOR HIS INVOLVEMENT IN AUM RELATED CRIMINAL ACTIVITIES. HE HAS ADMITTED TO PRODUCING SARIN FOR THE SECT'S GAS ATTACKS.

WITNESSES DESCRIBED THE LABORATORY AS A TEMPORARY FACILITY CONTAINING LAPTOP COMPUTERS, DIGITAL EQUIPMENT, GLASS TUBING, GLASS EVAPORATORS, BEAKERS, BUNSEN BURNERS AND CERAMIC GRINDING AND MIXING BOWLS. THERE WERE LIMESTONE OR CALCRETE-TYPE ROCKS ON THE FLOOR AND BENCHES. OTHEAT EQUIPMENT INCLUDED A SMALL LABORATORY-SIZE, ROCK-CRUSHING MACHINE AND TWO SMALL GENERATORS.

[redacted]

[redacted]

[redacted]

ANOTHER DOCUMENT WRITTEN IN JAPANESE AND TITLED BANJAWARN STATION WAS LOCATED AT THE STATION. THIS SUGGESTED THE SECT MAY HAVE BEEN EXPERIMENTING ON SHEEP AS THE DOCUMENT CONTAINED NOTATIONS FOR CLASSIFYING DEAD OR INJURED SHEEP BY USING UNIQUE JAPANESE MARKINGS.

NEAR THE HOMESTEAD, 29 SHEEP CARCASSES WERE DISCOVERED AS WELL AS LARGE AMOUNTS OF CHEMICALS INCLUDING HYDROCHLORIC AND NITRIC ACIDS. THESE CHEMICALS ARE COMMONLY USED FOR SOIL ASSAYING AND ANALYSIS. HOWEVER, THEY ALSO CAN BE USED TO MAKE AGENTS SUCH AS PHOSGENE. NO INGREDIENTS FOR SARIN OR OTHER NERVE AGENTS WERE LOCATED. THE CHEMICALS WERE SEIZED AND SOIL SAMPLES FROM THE SHEEP CARCASS SITE WERE TAKEN FOR ANALYSIS. THE TEAM THEN RETURNED TO PERTH. (ANNEX 12 AND 13)

INITIAL ANALYSIS OF SOIL SAMPLES TAKEN FROM THE SITE WHERE DEAD SHEEP WERE FOUND IN A CIRCLE CONFIRMED MPA RESIDUE. ACCORDING TO EXPERTS MPA DOES NOT OCCUR NATURALLY.

CORE INVESTIGATIONS

BELIEVING THAT SARIN GAS HAD BEEN USED ON SHEEP AT BANJAWARN

STATION, FEDERAL AND WEST AUSTRALIAN POLICE OFFICERS RETURNED TO THE PROPERTY WITH A FORENSIC OFFICER AND STATE AND FEDERAL CHEMISTS TO CARRY OUT A COMPREHENSIVE EXAMINATION TO DETERMINE WHAT THE AUM SECT HAD BEEN DOING THERE.

AT THE SITE WHERE THE 29 CARCASSES WERE FOUND, SOIL, WOOL AND BONE SAMPLES WERE TAKEN FOR ANALYSIS. ALSO FOUND WERE TWO EAR TAGS INDICATING THAT THE SHEEP WERE TWO TO SEVEN YEARS OLD. THE SHEEP WERE ESTIMATED TO HAVE DIED 18 MONTHS PRIOR TO THEIR DISCOVERY BY THE NEW PROPERTY OWNERS. THIS SITE WAS UNUSUAL IN THAT THE SHEEP WERE GATHERED IN A SMALL AREA. A FORENSIC PATHOLOGIST'S REPORT ON THE DAMAGED SKULLS SUGGESTED THAT SOME OF THE SHEEP MAY HAVE BEEN ALIVE AT THE TIME THE DAMAGE WAS INFLICTED.. THE REPORT STATED THERE WAS ''.... EVIDENCE OF BLUNT-FORCE INJURY, CONSISTENT WITH A FLAT HAMMER-HEAD...-AND THERE WERE SIGNS OFL POSSIBLE INTERCRANIAL HAEMORRHAGE...''. (ANNEX 14)

SAMPLES COLLECTED FROM THE SHEEP-CARCASS SITE WERE ANALYSED BY AUSTRALIAN FORENSIC CHEMISTS USING PROCEDURES TO DETERMINE THE PRESENCE OF MPA. THE PROCEDURES WERE DEVELOPED BY DR ROBYN BLACK, A WORLD AUTHORITY ON NERVE AGENTS AND THEIR RESIDUES.

ALTHOUGH ALL GOVERNMENT SCIENTISTS AND CHEMISTS CONSULTED IN THIS MATTER AGREE ON THE PRESENCE OF MPA IN SOME OF THE SAMPLES TESTED. SOME SCIENTISTS ARGUE THAT, ACCORDING TO DR BLACK, THE PRESENCE OF ANOTHER BY-PRODUCT KNOWN AS ISATOPROPYL METHYLPHOSPHONIC ACID (IMPA) IS CONCLUSIVE EVIDENCE OF SARIN.

DR BLACK REPORTS THAT IMPA IS USUALLY PRESENT AT MUCH LOWER LEVELS THAN MPA IN SOIL THAT HAS BEEN EXPOSED TO SARIN. BECAUSE MPA LEVELS WERE SO LOW IN SAMPLES OBTAINED AT BANJAWARN IT IS UNDERSTOOD THAT MOST EQUIPMENT CURRENTLY AVAILABLE FOR TESTING FOR THE PRESENCE OF IMPA IS NOT SUFFICIENTLY SENSITIVE TO PROVIDE CONFIRMATION THAT SARIN WAS USED. HOWEVER, WHEN FORMED, IMPA EXISTS IN MINUTE LEVELS AND EVEN SHORT-TERM EXPOSURE TO THE ELEMENTS INCREASES DIFFICULTY OF DETECTION. (ANNEX 15)

TO MAKE THE SITE SAFE, SOIL AND SHEEP CARCASSES WERE BURIED IN A DEEP PIT BY THE INVESTIGATION TEAAT IN ACCORDANCE WITH RECOMMENDATIONS FROM SCIENTIFIC EXPERTS WHO ADVISED THAT THE SARIN GAS DEGRADATION BY-PRODUCT WAS HARMLESS.

FORENSIC EXAMINATIONS WERE CONDUCTED AT A RUBBISH DUMP NEAR THE HOMESTEAD. JAPANESE FOOD CONTAINERS AND WRAPPINGS, PROBABLY DUMPED BY SECT MEMBERS, WERE FOUND IN ONE AREA OF THE DUMP SITE. SOME RUBBISH AT THE SITE HAD BEEN BURNT WITH THE ASSISTANCE OF AN ACCELERANT SUCH AS PETROL. THE ASHES SEARCHED VARIED IN DEPTH TO ABOUT 16 INCHES (400 MILLIMETRES) AND COVERED ABOUT 14 SQUARE YARDS (15 SQUARE METRES).

MANY SMALL EMPTY BOTTLES WERE FOUND IN THE ASHES, ALONG WITH A CERAMIC 'BUCHNER' LABORATORY STANDARD FUNNEL USED FOR FILTERING SOLIDS FROM LIQUIDS. ALSO LOCATED WAS A RECHARGEABLE BATTERY WITH THE NAME OF ''MAKI'' WRITTEN ON IT. MAKI WAS A SECT MEMBER WHO LIVED AT THE PROPERTY UNTIL IT WAS SOLD. A FRONT-END LOADER WAS USED TO REMOVE A CROSS-SECTION OF THE REMAINDER OF THE DUMP SITE TO A LEVEL WHERE BARE EARTH WAS EXPOSED.

NO FURTHER MATERIAL OF EVIDENTIARY VALUE WAS LOCATED AND THE SITE WAS DECLARED SAFE FROM CONTAMINATION. A LINE SEARCH WAS CONDUCTED OF THE AREA SURROUNDING THE MAIN DUMP SITE WHICH COVERED AN AREA OF ABOUT 5-7 ACRES (2-3 HECTARES). NOTHING OF SIGNIFICANCE WAS FOUND.

SOME MEMBERS OF THE JOINT OPERATION TEAM TRAVELLED TO THE MULGA QUEEN ABORIGINAL COMMUNITY 40 MILES (60 KILOMETRES) NORTH-EAST OF BANJAWARN STATION (WHEN) AND TOOK STATEMENTS ABOUT SIGHTINGS OF SECT MEMBERS. WITNESSES REPORTED SEEING PEOPLE BELIEVED TO BE SECT MEMBERS IN AND AROUND BANJAWARN HOMESTEAD AND ON THE AIRSTRIP AT TIMES WEARING PROTECTIVE CLOTHING WHICH INCLUDED RUBBER GUMBOOTS AND LARGE GLOVES.

THE SEARCH AT BANJAWARN CONCENTRATED ON PHOTOGRAPHIC, VIDEO AND FORENSIC EXAMINATIONS OF THE BUILDING IDENTIFIED AS THE LABORATORY. ITEMS WERE LOCATED WHICH LINKED THE SECT WITH THE BUILDING AND INCLUDED COMPANY MARKINGS FROM MAHAPOSYA PTY LTD ON PIECES OF TAPE AND CARDBOARD.

[redacted]

[redacted]

ASSESSMENT

THE AUSTRALIAN FEDERAL POLICE HAVE ASSESSED THAT THE SECT USED THE BANJAWARN STATION:

- TO CONDUCT NERVE-AGENT EXPERIMENTS ON SHEEP
- [redacted]
- WITH THE INTENTION OF ESTABLISHING A PERMANENT FACILITY
- AND THAT THERE IS NO EVIDENCE OF ESTABLISHED SECT MEMBERSHIP IN AUSTRALIA.

THE SECTS ACTIVITIES IN AUSTRALIA SIGNIFICANTLY PRE-DATE THE DOOMSDAY ACTIVITIES ANNOUNCED TO THE WORLD FOLLOWING THE TOKYO SUBWAY GAS ATTACK.

THERE IS SOME EVIDENCE TO SUPPORT THE CONTENTION THAT MATSUMOTO AND HIS FOLLOWERS PLANNED TO USE BANJAWARN AS A REMOTE SAFE HAVEN FOR THE SECT. HOWEVER, IS MORE LIKELY THAT MATSUMOTO INTENDED TO BE IN AUSTRALIA DURING THE WHEN THE MAJOR ATTACKS WERE TO TAKE PLACE.

IT WILL, OF COURSE, BE INTERESTING TO ASCERTAIN THE PURPOSE OF MATSUMOTO'S INTENTION TO RETURN TO AUSTRALIA PARTICULARLY AS HE WAS PLANNING TO RETURN THROUGH SYDNEY, A MAJOR POPULATION CENTRE ON THE EAST COAST.

INTERNATIONAL COOPERATION

MEMBERS OF THE AUSTRALIAN FEDERAL POLICE INVESTIGATION TEAM VISITED JAPAN AND THE USA DURING THEIR INVESTIGATION. THE JAPANESE NATIONAL POLICE AGENCY PROVIDED INFORMATION ABOUT THE PROGRESS OF THEIR INVESTIGATION INTO THE TOKYO SUBWAY GASSINGS AND RELATED SECT ACTIVITY AND THE ATTEMPTED MURDER OF ITS DIRECTOR-GENERAL. A DETAILED BRIEFING HAS BEEN PROVIDED TO THE NATIONAL POLICE AGENCY ON THE SIGNIFICANCE OF THE SECT'S ACTIVITIES IN AUSTRALIA. INFORMATION WAS ALSO EXCHANGED WITH THE FBI AND THE NEW YORK POLICE DEPARTMENT JOINT TERRORIST TASK FORCE WHO WERE RESPONSIBLE FOR INVESTIGATING THE NEW YORK CHAPTER OF THE SECT.

AN OUTCOME OF THESE DISCUSSIONS WAS A NEED TO EXCHANGE INFORMATION ON INVESTIGATION STRATEGIES FOR THIS TYPE OF CRIME. THIS INVESTIGATION HAS DEMONSTRATED A NEED FOR CLOSE COOPERATION AND THE ESTABLISHMENT OF MULTI-LATERAL INVESTIGATION TEAMS AS REQUIRED.

SWIFT INTERNATIONAL COOPERATION IS REQUIRED SO THAT TASK TEAMS CAN SUPPORT ANY COUNTRY DEALING WITH CRIMES OF THIS NATURE. SEVERAL BENEFITS EVOLVE FROM THIS APPROACH WHICH INCLUDE THE:

- ENHANCED FLOW OF INFORMATION BETWEEN AFFECTED COUNTRIES.,
- IMPROVED EXPERTISE IN DEVELOPING SCIENTIFIC KNOWLEDGE RELATING TO THE PRINCIPLE OFFENCES

- ESTABLISHMENT OF NETWORKS FOR REACHING COMMON GOALS.,
- SUPPORT GIVEN TO THE COUNTRY WITH THE PRINCIPAL OFFENCE WILL BE IN ACCORDANCE WITH RESPECTIVE LEGISLATION AND GOVERNMENT POLICY. (ANNEX 17)

APPENDIX LIST

MAP OF AUSTRALIA (SHOWING LOCATION OF BANJAWARN)

EVENT FLOW CHART

PHOTOGRAPH/S BANJAWARNAT - VASTNESS - REMOTENESS

PLANS OF BANJAWARN WITH INSET

CSIRO REPORT

PHOTOGRAPHS OF SECT MEMBERS INCLUDING: -MATSUMOTO -ENDO -SHIMADA -NAKAGAWA -HAYAKAWA -MAKI -INOUE

LIST OF SECT MEMBERS ARRIVING AT PERTH - SEPT. 1993

[redacted]

CHEMICAL FORMULAE

[redacted]

PHOTOGRAPHS OF THE DEAD SHEEP SITE AT BANJAWARN.

PHOTOGRAPHS OF THE SEIZED CHEMICALS

FORENSIC PATHOLOGY REPORT RE DAMAGE TO SHEEP SKULLS

REPORTS - DSTO AND WA CHEM. CENTRE RE SARIN AND RESIDUES

PHOTOGRAPHS OF VICKER'S WELL DIGGINGS AT BANJAWARN

LIST OF AUSTRALIAN LEGISLATION

PSYCHOLOGICAL PROFILE

EMERGING ISSUES.

PSYCHOLOGICAL PROFILE

A GENERAL PSYCHOLOGICAL ASSESSMENT WAS PREPARED BY AN AUSTRALIAN FEDERAL POLICE PSYCHOLOGIST WHO SUGGESTED THAT THERE IS NO SPECIFIC PSYCHOLOGICAL PROFILE THAT WOULD PREDICT A PERSON'S SUSCEPTIBILITY FOR RECRUITMENT TO THE SECT, ALTHOUGH MANY SECT MEMBERS WOULD HAVE THEIR PERSONAL, EMOTIONAL, SOCIAL AND INTELLECTUAL NEEDS SATISFIED.

THE RECRUITMENT OF MEMBERS COULD TARGET PEOPLE EXPERIENCING AN EXISTENTIAL OR PERSONAL CRISIS WHICH WOULD PROVIDE AN ILLUSION OF SUPPORT, MEANING, VALUE OR POWER. SYSTEMATIC RECRUITMENT IDENTIFIES

CERTAIN CHARACTERISTICS SUCH AS CO-DEPENDENCY. ONCE PEOPLE ARE RECRUITED, SECTS USE SPECIFIC PROCESSES TO MAINTAIN THE ILLUSION TO MANIPULATE THEIR FOLLOWERS. SOME POWERFUL TECHNIQUES INCLUDE, MIND DISTORTING NARCOTICS, ALIENATION FROM ALTERNATIVE VIEWPOINTS, INDOCTRINATION REGIMES AND RIGID ROLE ASSIGNMENT ARE EMPLOYED.

OTHER CULT SPECIALISTS BELIEVE THAT ''THE LACK OF A FATHER FIGURE IN THE HOME LEADS THE YOUNG TOWARDS CULTS WITH STRONG MALE LEADERSHIP''.

EMERGING ISSUES

AUSTRALIA HAS A VARIETY OF FEDERAL AND STATE LAWS THAT COULD BE APPLIED IN THE EVENT OF AN INCIDENT SUCH AS THE TOKYO SARIN GAS ATTACK TAKING PLACE IN AUSTRALIA. PROSECUTIONS FOR LOSS OF LIFE AND ASSOCIATED OFFENCES AGAINST THE PERSON ARE CLEAR. MORE COMPLEX ISSUES EMERGE WHEN CRIMES RELATING TO CHEMICAL, BIOLOGICAL AND NUCLEAR MATERIAL CROSS INTERNATIONAL BOUNDARIES. CURRENTLY AUSTRALIAN FEDERAL LEGISLATION FOR DEALING WITH CRIME RELATING TO BIOLOGICAL AND NUCLEAR INCIDENTS IS ADEQUATE FOR MILITARY INCIDENTS BUT AMENDMENTS FOR NON-MILITARY INCIDENTS ARE NECESSARY.

AUSTRALIA ESTABLISHED THE CHEMICAL WEAPONS CONVENTION OFFICE TO ADMINISTER THE INTERNATIONAL CHEMICAL WEAPONS CONVENTION TREATY

WHICH CANNOT BE ENACTED UNTIL 65 OF THE 169 PARTICIPATING COUNTRIES RATIFY IT CURRENTLY, 36 COUNTRIES HAVE SIGNED RATIFICATION AND IT IS EXPECTED THAT RATIFICATION WILL BE COMPLETE BY LATE 1996.

AUSTRALIAN FEDERAL LAW-ENFORCEMENT AGENCIES ARE RESPONSIBLE FOR ENFORCING LAWS IN RELATION TO CONSTITUTIONAL REQUIREMENTS FOR FOREIGN NATIONALS, IMMIGRATION AND THE INFLUX OF CRIMINALS. THE AUSTRALIAN JOINT STANDING COMMITTEE ON MIGRATION INQUIRY INTO AUSTRALIA'S VISA SYSTEM FOR VISITORS TO AUSTRALIAN IS CONSIDERING THREE OPTIONS:

- ABOLITION OF THE REQUIREMENT FOR ALL VISITORS TO OBTAIN A VISA BEFORE TRAVELLING TO AUSTRALIA.
- ABOLITION OF REQUIREMENT FOR SELECTED NATIONALS, AND
- MAINTAIN THE EXISTING SYSTEM BUT MAKE IT MORE EFFICIENT.

LAW-ENFORCEMENT AGENCIES PUT FORWARD THE VIEW THAT ALL VISITORS MUST BE CLEARED TO ENTER AUSTRALIA BEFORE THEY DEPART THEIR COUNTRY OF ORIGIN. THIS CAN BE ACHIEVED BY SOPHISTICATED INFORMATION COLLECTION, MANIPULATION AND COMMUNICATION WHICH ADDRESSES PRIVACY, BILATERAL RELATIONS AND DATA-MATCHING IMPLICATIONS. THIS HAS OCCURRED PRIMARILY FOR TOURISM AND TRADE.

NOTE: FOR REASONS OF LEGAL PROCESS THE PARAGRAPHS AND PHRASES MARKED AS CONFIDENTIAL IN THIS BRIEF SHOULD NOT BE RELEASED OUTSIDE THE U.S. SENATE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS WITHOUT THE PRIOR CONSENT OF THE GOVERNMENT OF AUSTRALIA. OTHER MATERIAL IN THIS BRIEF MAY BE MADE PUBLIC AND MAY BE ATTRIBUTED TO THE AUSTRALIAN FEDERAL POLICE.

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 14b.

THE AUSTRALIAN INVESTIGATION OF THE AUM SHINRIKYO SECT

This report has been prepared by the Australian Federal Police
for the United States Committee on
Governmental Affairs Permanent Subcommittee on Investigations.

Enquiries regarding this report should be directed to:
General Manager
National Operations
Australian Federal Police
PO Box 401
Canberra ACT 2601
Australia.

Telephone: 06 275 7583
Facsimile 06 275 7567

Caveat

This document is the property of the Australian Government. Its contents may not be copied or disseminated further without prior approval by the Australian Federal Police.

APPENDIX LIST

1 MAP OF AUSTRALIA (SHOWING LOCATION OF BANJAWARN)

2 EVENT FLOW CHART

3 PHOTOGRAPH/S BANJAWARN - VASTNESS -REMOTENESS

4 PLANS OF BANJAWARN WITH INSET

6 PHOTOGRAPHS OF SECT MEMBERS INCLUDING:
-MATSUMOTO -ENDO
-SHIMADA -NAKAGAWA
-HAYAKAWA -MAKI
-INOUE

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9 CHEMICAL FORMULAE

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13 PHOTOGRAPHS OF THE SEIZED CHEMICALS

14 FORENSIC PATHOLOGY REPORT RE DAMAGE TO SHEEP SKULLS

15 REPORT - WA CHEMISTRY CENTRE RE SARIN AND RESIDUES

16 PHOTOGRAPHS OF VICKER'S WELL DIGGINGS AT BANJAWARN

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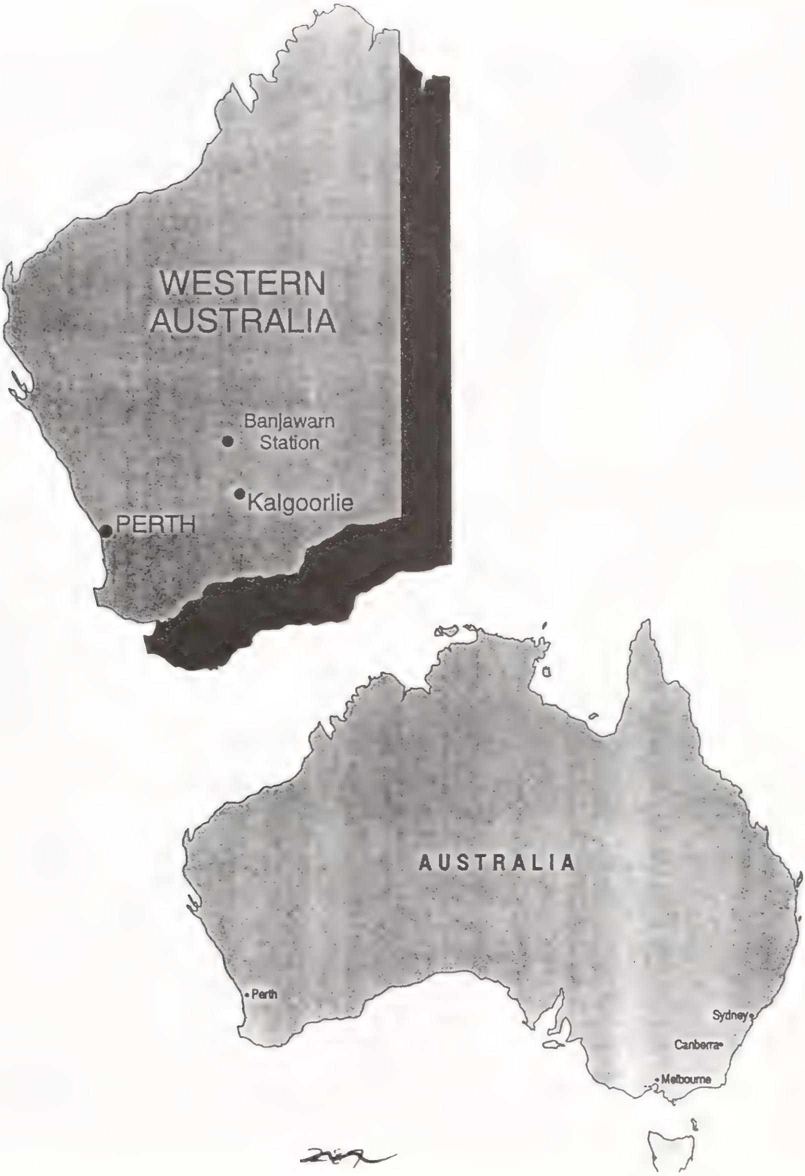
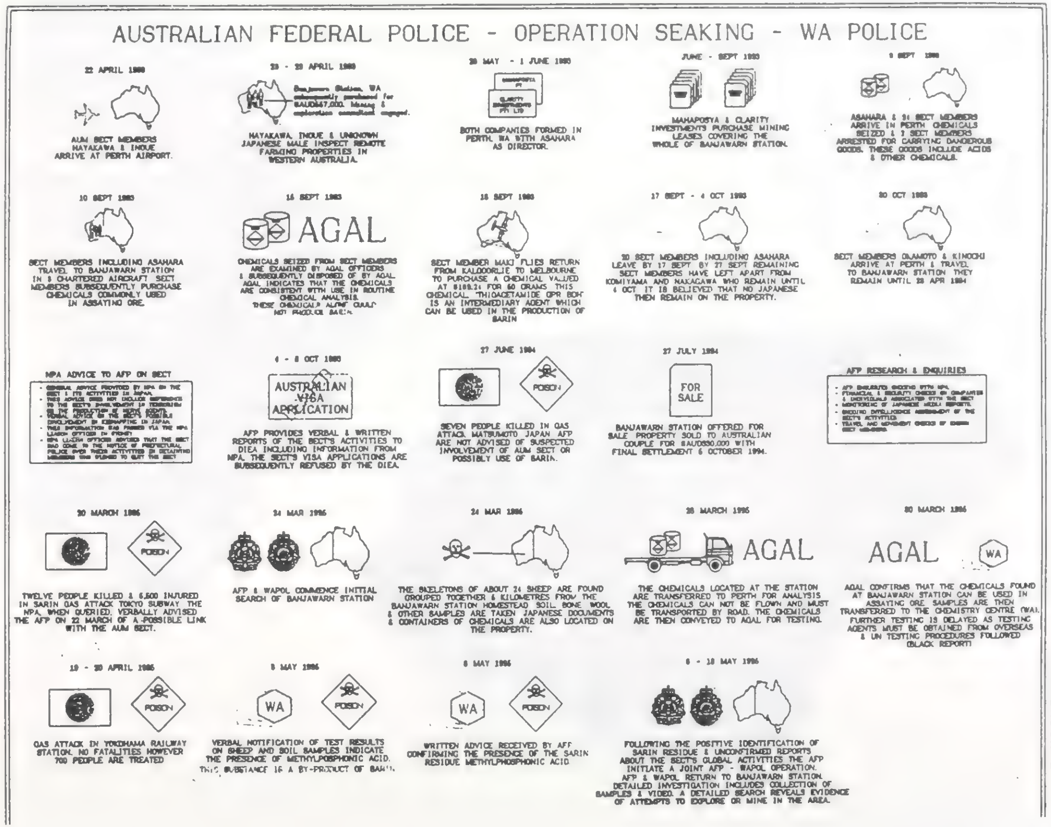
18 PSYCHOLOGICAL PROFILE

19 EMERGING ISSUES.

APPENDIX 1


WESTERN AUSTRALIA
Banjawarn Station
Kalgoorlie
PERTH
AUSTRALIA
Perth
Sydney
Canberra
Melbourne

AUSTRALIAN FEDERAL POLICE - OPERATION SEAKING - WA POLICE


Banjawarn Station, WA subsequently purchased for $AUD467,000. Mining & exploration consultant engaged.
MAHAPOSYA PTY
CLARITY INVESTMENTS PTY LTD
AGAL
AUSTRALIAN VISA APPLICATION
POISON
FOR SALE
WA

22 APRIL 1993
AUM SECT MEMBERS HAYAKAWA & INOUE ARRIVE AT PERTH AIRPORT.

23 - 29 APRIL 1993
HAYAKAWA, INOUE & UNKNOWN JAPANESE MALE INSPECT REMOTE FARMING PROPERTIES IN WESTERN AUSTRALIA.

20 MAY - 1 JUNE 1993
BOTH COMPANIES FORMED IN PERTH, WA WITH ASAHARA AS DIRECTOR.

JUNE - SEPT 1993
MAHAPOSYA & CLARITY INVESTMENTS PURCHASE MINING LEASES COVERING THE WHOLE OF BANJAWARN STATION.

9 SEPT 1993
ASAHARA & 24 SECT MEMBERS ARRIVE IN PERTH. CHEMICALS SEIZED & 2 SECT MEMBERS ARRESTED FOR CARRYING DANGEROUS GOODS. THESE GOODS INCLUDE ACIDS & OTHER CHEMICALS.

10 SEPT 1993
SECT MEMBERS INCLUDING ASAHARA TRAVEL TO BANJAWARN STATION IN 3 CHARTERED AIRCRAFT. SECT MEMBERS SUBSEQUENTLY PURCHASE CHEMICALS COMMONLY USED IN ASSAYING ORE.

15 SEPT 1993
CHEMICALS SEIZED FROM SECT MEMBERS ARE EXAMINED BY AGAL OFFICERS & SUBSEQUENTLY DISPOSED OF BY AGAL. AGAL INDICATES THAT THE CHEMICALS ARE CONSISTENT WITH USE IN ROUTINE CHEMICAL ANALYSIS. THESE CHEMICALS ALONE COULD NOT PRODUCE SARIN.

18 SEPT 1993
SECT MEMBER MAKI FLIES RETURN FROM KALGOORLIE TO MELBOURNE TO PURCHASE A CHEMICAL VALUED AT $189.24 FOR 60 GRAMS. THIS CHEMICAL, THIOACETAMIDE GPR 50G IS AN INTERMEDIARY AGENT WHICH CAN BE USED IN THE PRODUCTION OF SARIN

17 SEPT - 4 OCT 1993
20 SECT MEMBERS INCLUDING ASAHARA LEAVE BY 17 SEPT. BY 27 SEPT REMAINING SECT MEMBERS HAVE LEFT APART FROM KOMIYAMA AND NAKAGAWA WHO REMAIN UNTIL 4 OCT. IT IS BELIEVED THAT NO JAPANESE THEN REMAIN ON THE PROPERTY.

30 OCT 1993
SECT MEMBERS OKAMOTO & KINOCHI ARRIVE AT PERTH & TRAVEL TO BANJAWARN STATION. THEY REMAIN UNTIL 28 APR 1994

NPA ADVICE TO AFP ON SECT

- GENERAL ADVICE PROVIDED BY NPA ON THE SECT & ITS ACTIVITIES IN JAPAN.
- THIS ADVICE DOES NOT INCLUDE REFERENCE TO THE SECT'S INVOLVEMENT IN TERRORISM OR THE PRODUCTION OF NERVE AGENTS.
- VERBAL ADVICE ON THE SECT'S POSSIBLE INVOLVEMENT IN KIDNAPPING IN JAPAN.
- THIS INFORMATION WAS PASSED VIA THE NPA LIAISON OFFICER IN SYDNEY
- NPA LIAISON OFFICER ADVISED THAT THE SECT HAD COME TO THE NOTICE OF PREFECTURAL POLICE OVER THEIR ACTIVITIES IN DETAINING MEMBERS WHO WISHED TO QUIT THE SECT

4 - 8 OCT 1993
AFP PROVIDES VERBAL & WRITTEN REPORTS OF THE SECT'S ACTIVITIES TO DIEA INCLUDING INFORMATION FROM NPA. THE SECT'S VISA APPLICATIONS ARE SUBSEQUENTLY REFUSED BY THE DIEA.

27 JUNE 1994
SEVEN PEOPLE KILLED IN GAS ATTACK MATSUMOTO JAPAN. AFP ARE NOT ADVISED OF SUSPECTED INVOLVEMENT OF AUM SECT OR POSSIBLY USE OF SARIN.

27 JULY 1994
BANJAWARN STATION OFFERED FOR SALE. PROPERTY SOLD TO AUSTRALIAN COUPLE FOR $AUD330,000 WITH FINAL SETTLEMENT 6 OCTOBER 1994.

AFP RESEARCH & ENQUIRIES

- AFP ENQUIRIES ONGOING WITH NPA.
- FINANCIAL & SECURITY CHECKS ON COMPANIES & INDIVIDUALS ASSOCIATED WITH THE SECT
- MONITORING OF JAPANESE MEDIA REPORTS.
- ONGOING INTELLIGENCE ASSESSMENT OF THE SECT'S ACTIVITIES.
- TRAVEL AND MOVEMENT CHECKS OF KNOWN SECT MEMBERS.

20 MARCH 1995
TWELVE PEOPLE KILLED & 5,500 INJURED IN SARIN GAS ATTACK TOKYO SUBWAY. THE NPA, WHEN QUERIED, VERBALLY ADVISED THE AFP ON 22 MARCH OF A POSSIBLE LINK WITH THE AUM SECT.

24 MAR 1995
AFP & WAPOL COMMENCE INITIAL SEARCH OF BANJAWARN STATION

24 MAR 1995
THE SKELETONS OF ABOUT 24 SHEEP ARE FOUND GROUPED TOGETHER 6 KILOMETRES FROM THE BANJAWARN STATION HOMESTEAD. SOIL, BONE, WOOL & OTHER SAMPLES ARE TAKEN. JAPANESE DOCUMENTS & CONTAINERS OF CHEMICALS ARE ALSO LOCATED ON THE PROPERTY.

28 MARCH 1995
THE CHEMICALS LOCATED AT THE STATION ARE TRANSFERRED TO PERTH FOR ANALYSIS. THE CHEMICALS CAN NOT BE FLOWN AND MUST BE TRANSPORTED BY ROAD. THE CHEMICALS ARE THEN CONVEYED TO AGAL FOR TESTING.

30 MARCH 1995
AGAL CONFIRMS THAT THE CHEMICALS FOUND AT BANJAWARN STATION CAN BE USED IN ASSAYING ORE. SAMPLES ARE THEN TRANSFERRED TO THE CHEMISTRY CENTRE (WA). FURTHER TESTING IS DELAYED AS TESTING AGENTS MUST BE OBTAINED FROM OVERSEAS & UN TESTING PROCEDURES FOLLOWED (BLACK REPORT)

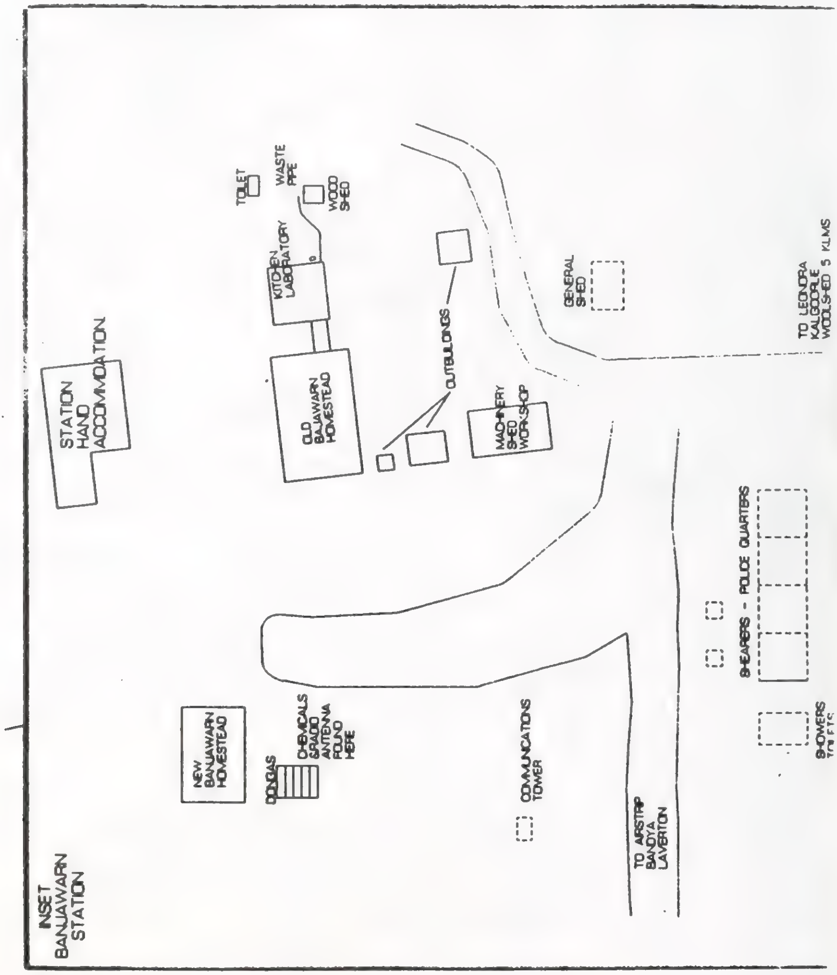
19 - 20 APRIL 1995
GAS ATTACK IN YOKOHAMA RAILWAY STATION. NO FATALITIES HOWEVER 700 PEOPLE ARE TREATED

3 MAY 1995
VERBAL NOTIFICATION OF TEST RESULTS ON SHEEP AND SOIL SAMPLES INDICATE THE PRESENCE OF METHYLPOSPHONIC ACID. THIS SUBSTANCE IS A BY-PRODUCT OF SARIN.

8 MAY 1995
WRITTEN ADVICE RECEIVED BY AFP CONFIRMING THE PRESENCE OF THE SARIN RESIDUE METHYLPHOSPHONIC ACID

8 - 18 MAY 1995
FOLLOWING THE POSITIVE IDENTIFICATION OF SARIN RESIDUE & UNCONFIRMED REPORTS ABOUT THE SECT'S GLOBAL ACTIVITIES THE AFP INITIATE A JOINT AFP - WAPOL OPERATION. AFP & WAPOL RETURN TO BANJAWARN STATION. DETAILED INVESTIGATION INCLUDES COLLECTION OF SAMPLES & VIDEO. A DETAILED SEARCH REVEALS EVIDENCE OF ATTEMPTS TO EXPLORE OR MINE IN THE AREA.

APPENDIX 3


INSET BANJAWARN STATION
STATION HAND ACCOMMODATION
TOILET
WASTE PIPE
WOOD SHED
KITCHEN LABORATORY
OLD BANJAWARN HOMESTEAD
OUTBUILDINGS
MACHINERY SHED WORKSHOP
GENERAL SHED
TO LEONORA KALGOORLIE WOOLSHED 5 KLMS
SHEARERS - POLICE QUARTERS
SHOWERS
NEW BANJAWARN HOMESTEAD
DONGAS
CHEMICALS &RADIO ANTENNA FOUND HERE
COMMUNICATIONS TOWER
TO AIRSTRIP BANDYA LAVERTON

APPENDIX 6

MATSUMOTO, Chizuo

a.k.a. ASAHARA, Shoko

D.O.B. 02 MAR 1955

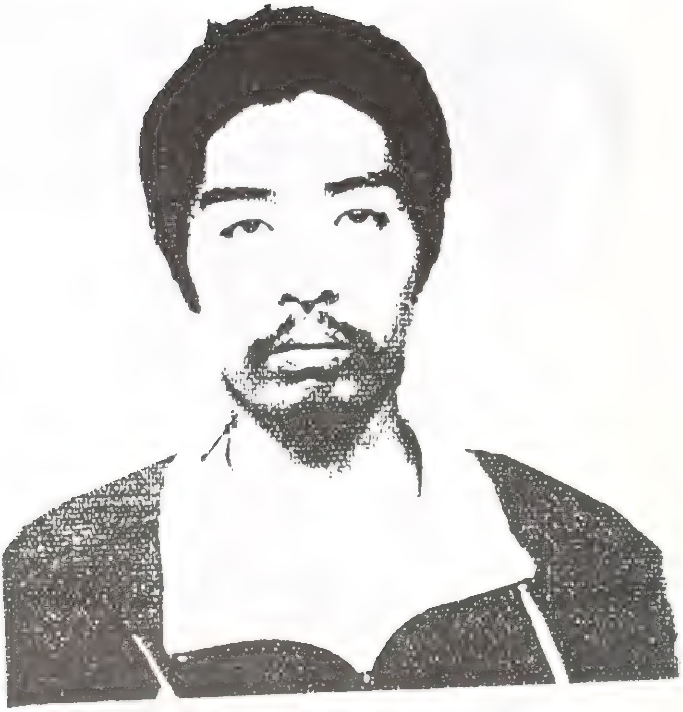
SHIMADA, Yasuko

D.O.B. 05 JAN 1941

HAYAKAWA, Kiyohide

D.O.B. 14 JUL 1949

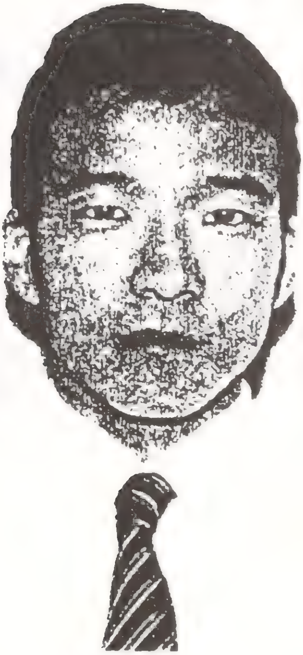
Senior Member Aum Shinrikyo



INOUE, Yoshihiro

D.O.B. 28 DEC 1969

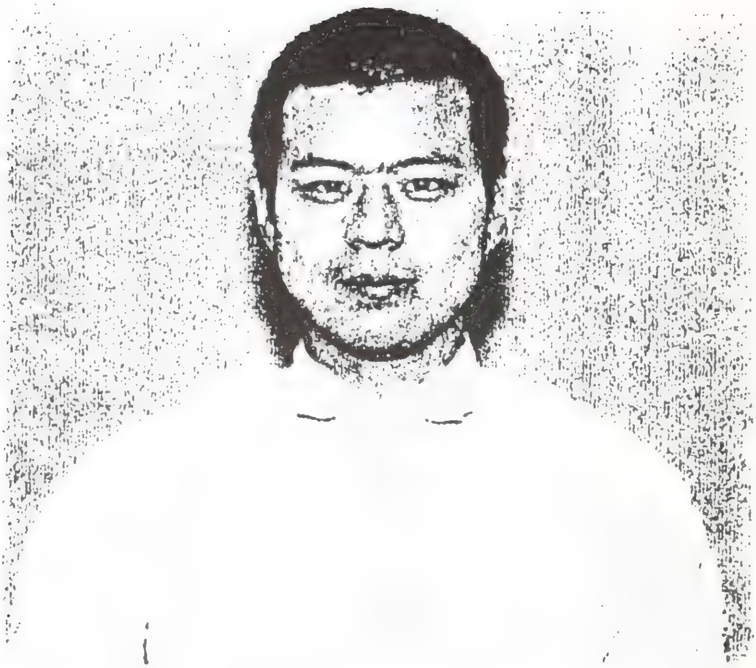
Member Aum Shinrikyo



ENDO, Seiichi

D.O.B. 05 JUN 1960

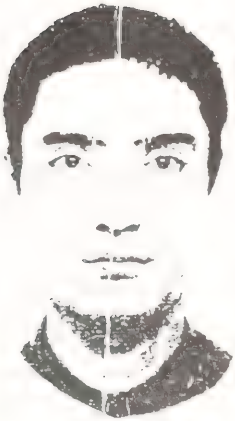
Member Aum Shinrikyo



NAKAGAWA, Tomomasa

D.O.B. 25 OCT 1962

Member Aum Shinrikyo



MAKI, Tsuyoshi

D.O.B. 24 NOV 1960

Member Aum Shinrikyo

APPENDIX 7 (11)

DETAILS OF PERSONS TRAVELLING WITH THE MAHAPOSYA COMPANY AND THE 'AUM' RELIGIOUS SECT ON QANTAS FLIGHT 70 ON THURSDAY 9 SEPTEMBER 1993.

NAME	SEX	DOB	PASSPORT	OCCUPATION
Yukiko KIDA	f	15/10/77	MM0348327	Student
Toru TOYODA	m	23/1/68	MN1126557	Office Worker
Akira HORI	m	8/8/59	MM4246778	Office Worker
Miwa MATSUMOTO	f	22/7/78	MK4806189	Student
Tomomitsu NIIMI	m	9/3/64	MM4585859	Office Worker
Masaharu ITONAGA	m	29/9/68	ML1131596	Office Worker
Nobuki AMI	m	14/5/64	MN3388229	Office Worker
Yutaka ONAYA	m	12/10/63	ML2255855	Office Worker
Satoru SHINOHARA	m	15/1/69	ML1130690	Office worker
Hideaki TATSUTA	m	16/9/58	ML8720639	Medical Doctor
Chika TANABE	f	22/1/79	ML1575925	Student
Satoru GO	m	17/5/58	MK5313796	Office Worker
Kenichi HIROSE	m	12/6/64	ML7597795	Businessman
Yuki KAKINUMA	f	1/3/79	ML1030847	Student
Chikako SHIMIZU	f	22/9/74	ML1130693	Student
Yasuko MARUHASHI	f	6/8/82	MM0185140	Student
Naoko YAMAMOTO	f	29/12/67	MN3095066	Student
Takanori KOMIYAMA	m	15/12/68	ML1268614	Office worker
Seiichi ENDO	m	5/6/60	MK1799417	Doctor
Hideo MURAI	m	5/12/58	MK3053890	Office Worker
Tomomasa NAKAGAWA	m	25/10/62	MK3833843	Doctor
Chizuo MATSUMOTO	m	2/3/55	MK4807684	Company President
Wakashio TOGASHI	m	17/12/59	MK5093603	Office Worker
Naruhito NODA	m	15/11/66	MM0941809	Office Worker
Yoshihiro INOUE	m	28/12/69	MM4898861	Office Worker

↓ $HCl(3)+HNO_3(1)$ 20~30ml （50ml 三角フラスコ）

↓ heat

↓ $H_2SO_4(1+1)$ 20ml + $HClO_4$ 5ml （50ml 三角フラスコ）

↓ heat〔硫酸白煙発生〕

↓ cooling

↓ $HNO_3(1+4)$ 約50ml （50ml 三角フラスコ）

↓ heat，煮沸

吸引ろ過（吸引フラスコ 250ml，桐山ロート）←

↓ 温水洗浄

↓ 不溶解残留物除去

ろ液 約250ml 希釈（500ml ビーカー）

↓ NH_3 aq 過剰（pHメータ or pH試験紙）〔[illegible]酸性の場合 + NH_4Cl 約5g〕

↓ 煮沸

吸引ろ過（吸引フラスコ 500ml，桐山ロート）

沈殿物（300ml ビーカー）

↓ 温HCl(1+3)溶解（100ml 三角フラスコ）

液量100ml

↓ + NH_3 aq

再沈殿・吸引ろ過（吸引フラスコ 250ml or 500ml，桐山ロート）

沈殿物

↓ 温水洗浄後，元のビーカーに吹き落とす

↓ 60% $HClO_4$ 15ml，H_2O 約50ml

↓ 煮沸溶解〔沈殿に[illegible] 5ml 加え，砂ざら上で白煙が生ずるまで濃縮溶解〕

液量100ml

↓ + Na_2SO_3 約0.2g

↓ 煮沸（亜硫酸ガス追い出す）…… check

↓ 2% チオアセトアミド aq 4ml〔[illegible]過剰に加える〕

↓ 1分間煮沸

↓ 少量のろ紙パルプ …… check

吸引ろ過（吸引フラスコ 250ml，桐山ロート）

↓ 冷水洗浄

ろ液（300ml ビーカー）

↓ 数分間煮沸（H_2S 除去）

| 冷却

↓ he

↓ he

↓ 冷

↓ +

磁器蒸

↓ + HN

↓ + HN

↓ 蒸発

↓ + HN

↓ + H_2

↓ 加温

〔鉛

未

元

受

$N/100$ 硫

〔ジョンズ還

H_g 2~3g

↓ + HNO_3

加温溶

↓ + H_2O

↓ + 粒状

80～

試料 1g 秤量 （30ml ニッケルるつぼ）

↓ 約5g KOH

↓ heat （水分除去）

↓ heat （数分間融解）

↓ 冷却

↓ + 温水，溶解

磁器蒸発皿；径12cm

↓ + HNO_3で中和

↓ + HNO_3 10ml

↓ 蒸発乾固

↓ + HNO_3 2ml

↓ + H_2O 100ml

↓ 加温溶解

［鉛還元器］

粒状Pb (864～140μm)　　メッシュ

↓ HCl (1+3) 洗　　（ろうと，500ml ビーカー）

↓ HCl (1+3)を用いて気泡が入らぬよう…　［約150cc］

充てん（鉛還元器）

↓ HCl (1+11) 60～80ml/min，洗

↓ HCl (1+30) 80ml 洗

↓ HCl (1+11) 80ml 洗

受器中の溶液

↓ フェロイン指示薬 1ml

↓ リン酸 2ml

N/100 硫酸第二セリウム標準溶液で滴定 ［標準溶液の消費量が一定値になるまで洗浄操作繰返す］

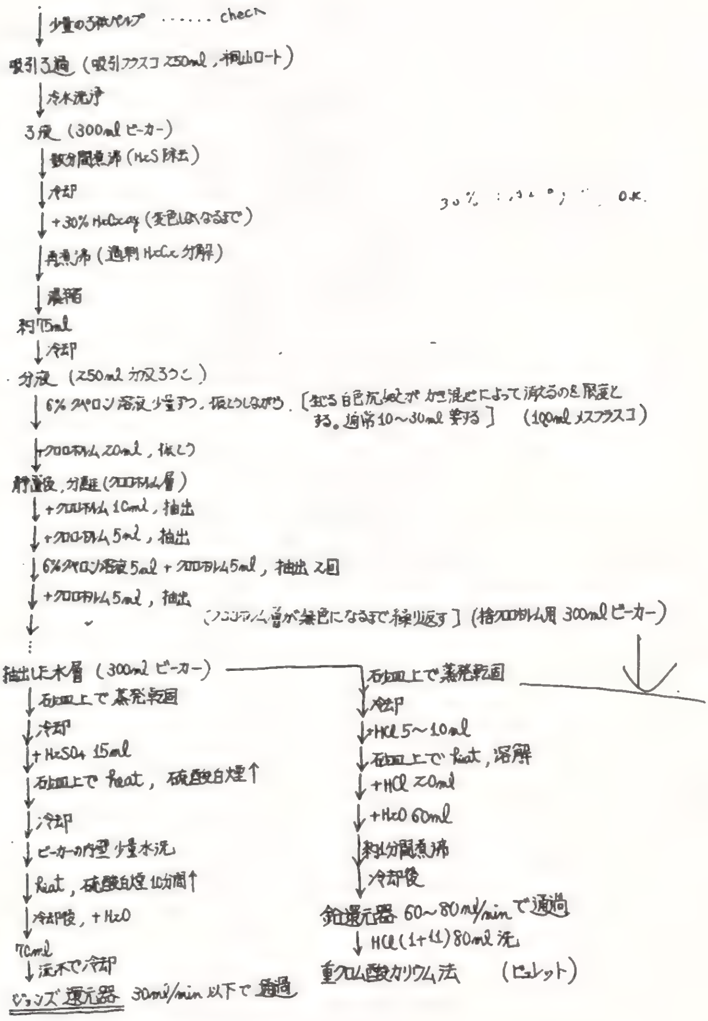
［ジョンズ還元器］

Hg 2～3g （1l ビーカー）

↓ + HNO_3 (1+1) 約20ml 加温溶解

↓ + H_2O 400～500ml

↓ + 粒状Zn (864～503μm) 80～100g　　メッシュ



↓ 少量のろ紙パルプ ・・・・・・ check

吸引ろ過（吸引フラスコ 250ml，桐山ロート）

↓ 冷水洗浄

ろ液（300ml ビーカー）

↓ 数分間煮沸（H_2S 除去）

↓ 冷却

↓ +30% H_2O_2 aq（変色しなくなるまで）

30% [illegible] OK.

↓ 再煮沸（過剰 H_2O_2 分解）

↓ 濃縮

約75ml

↓ 冷却

分液（250ml 分液ろうと）

↓ 6% クペロン溶液 少量ずつ，振とうしながら．〔生じる白色沈殿がかき混ぜによって消えるのを限度とする。通常10～30ml 要する〕（100ml メスフラスコ）

↓ +クロロホルム 20ml，振とう

静置後，分離（クロロホルム層）

↓ +クロロホルム 10ml，抽出

↓ +クロロホルム 5ml，抽出

↓ 6% クペロン溶液 5ml + クロロホルム 5ml，抽出 2回

↓ +クロロホルム 5ml，抽出 〔クロロホルム層が無色になるまで繰り返す〕（捨クロロホルム用 300ml ビーカー）

↓

⋮

抽出した水層（300ml ビーカー）

↓ 砂皿上で蒸発乾固

↓ 冷却

↓ + H_2SO_4 15ml

↓ 砂皿上で heat，硫酸白煙↑

↓ 冷却

↓ ビーカー内壁 少量水洗

↓ heat，硫酸白煙 10分間↑

↓ 冷却後，+ H_2O

70ml

↓ 流水で冷却

ジョンズ還元器 30ml/min 以下で 通過

—

↓ 砂皿上で蒸発乾固

↓ 冷却

↓ +HCl 5～10ml

↓ 砂皿上で heat，溶解

↓ +HCl 20ml

↓ + H_2O 60ml

↓ 約1分間煮沸

↓ 冷却後

鉛還元器 60～80ml/min で通過

↓ HCl（1+11）80ml 洗

重クロム酸カリウム法 （ビュレット）

$^{N}/_{100}$ 硫酸第二セリウム [illegible]
操返す〕

〔ジョンズ還元器〕

Hg 2～3g （1l ビーカー）
↓ + HNO_3 (1+1) 約20ml
加温溶解
↓ + H_2O 400～500ml
↓ + 粒状Zn (864～503 μm)
80～100g

メッシュ

攪拌
↓ アマルガム化後，H_2O洗い
気泡が入らぬよう…
〔約150cc〕

ガラス管充てん（ジョンズ還元器）
↓ H_2SO_4 (5+95) 洗い，30ml/min以下
↓ 水洗い，30ml/min以下

受器取り替え（500ml 吸引フラスコ）
↓ H_2SO_4 (5+95) 90ml 洗い
↓ H_2O 15ml 洗い

受器中の溶液
↓ 不活性な air 急激に通じる（5分間）
↓ フェロイン指示薬 1ml
↓ リン酸 2ml

リン酸また

$^{N}/_{100}$ 硫酸第二セリウム標準溶液で滴定 〔標準溶液の消費量が一定値になるまで洗浄操作を

よって溶かしたら溶液と
（100ml メスフラスコ）

（ クロロホルム用 300ml ビーカー）

ビーカー

溶解

mlで適宜
ml 採

（ピペット）

試料 1g 秤量 (30ml ニッケルるつぼ) 30ml nickel melting vessel. 1g to be used for testing purposes.

↓ 約5g KOH About 5g.

↓ 加熱 (水分除去) Boil away water contained.

↓ 加熱 (数分間融解) Liquefied for a few minutes

↓ 冷却 Cool Down.

↓ + 温水, 溶解 Warm water and liquefy.

磁製蒸発皿 ; 径12cm. Ceramic vessel - Evaporation in Diameter 12 cm.

↓ + HNO_3 で中和 HNO_3 remove poison by using HNO_3

↓ + HNO_3 10ml add HNO_3 (10ml).

↓ 蒸発乾固 Evaporate and collect solid mass

↓ + HNO_3 20ml add 20ml HNO_3

↓ + H_2O 100ml add 100ml water.

↓ 加温溶解 dissolve by adding heat.

[鉛還元器] Lead reduction vessel.

粒状 Pb (84～140μm) lead in pellet form. ペレット

↓ HCl (1+3) 洗 Wash with Hydrochloric acid. (ろうと, 500ml ビーカー) Funnel, using 500ml beaker

↓ HCl (1+3) を用いて気泡が入らないよう… [約150cc] Use (a) 150cc of HCl to make so solution does not foam.

充てん (鉛還元器) Add solution to lead container.

↓ HCl (1+11) 60～80ml/min, 洗 Wash solution with 60-80ml/minute of HCl.

↓ HCl (1+30) 80ml 洗 Wash in 80ml of HCl (1+30).

↓ HCl (1+11) 80ml 洗 Wash in 80ml of HCl (1+11).

受器中の溶液 Place solution in receptacle

↓ スルホン指示薬 1ml Add 1ml of required amount of Heroin.

↓ リン酸 2ml Add 2ml of phosphoric Ac…

※ N/100 硫酸第二セリウム標準溶液で滴定 [標準溶液の消費量が一定値になるまで洗浄操作を繰返す]

Using a standard solution N/100 sulphuric acid no 2 serum → which is Testing strength of chemicals adding one chemical to other in order to verify how strong one of the liquids is. Using a continual washing process until consumed amount of standard solution reaches a set value.

Drip sulphuric acid into solution prepared above

[ジョーンズ還元器] Johns reduction vessel

Hg 2～3g (1l ビーカー) 2-3g + Hg (1L beaker) until

↓ + HNO_3 (1+1) 約20ml 20ml of HNO_3

加温溶解 Then melt by heating.

↓ + H_2O 400～500ml + 400 500ml Water

吸引ろ過（吸引フラスコ 250ml，桐山ロート） Absorbtion filter, 250 ml Absorbtion Flask, Kiriyama funnel

↓冷水洗浄 washed in the cold water.

ろ液（300ml ビーカー） solutions (300 ml beaker).

↓数分間煮沸（H_2S 除去） Boil for several minutes to remove H_2S

↓冷却 Cool

↓+30% H_2O_2 aq（変色しなくなるまで） add 30% H_2O_2 until it stops changing colour
30% 〃 OK

↓再煮沸（過剰 H_2O_2 分解） Boil for a few minutes in order to dissolve excess H_2O_2

↓濃縮 Concentrate

約25ml About 25 ml

↓冷却 Then Cool.

分液（250ml 分液ろうと） Separate the liquid using a 250 ml funnell

↓6% クペロン溶液を少量ずつ，振とうしながら ［生じた白色沈殿が振とうによって溶けるのを限度とする。通常10〜30ml 要する］（100ml メスフラスコ） Add 6% Kuperon solution a little bit at a time, in agitating. This produces a white sediment, keep stir until sediment disappears. Generally 10 30 ml of this is reqd. (100 ml mess flask)

↓+クロロホルム 20ml，振とう add 20 ml of Chloroform, and agitate.

静置後，分離（クロロホルム層） separation into Chloroform layers

↓+クロロホルム 10ml，抽出 add 10 ml Chloroform, Then extraction

↓+クロロホルム 5ml，抽出 Add 5 ml Chloroform, Then extraction

↓6% クペロン溶液 5ml + クロロホルム 5ml，抽出 2回 6% Kuperon solution (5 ml) + 5 ml Chloroform, Then extract Tw.

↓+クロロホルム 5ml，抽出 add 5 ml Chloroform, extract

↓ 〃

⋮ ［クロロホルム層が無色になるまで繰り返す］（捨クロロホルム用 300ml ビーカー）
repeat procedure until chloroform layers are colourless. For the use of chloroform use 300 ml beaker

抽出した水層（300ml ビーカー） Extracted layers of water - 300 ml beaker.

↓砂皿上で蒸発乾固 Evaporate and harden on surface of sandy surface

↓冷却 Cool

↓+H_2SO_4 15ml add 15 ml H_2SO_4

↓砂皿上で heat，硫酸白煙↑ heat on sandy until sulfuric acid in form of white smoke appears.

↓冷却 Cool

↓ビーカーの内壁を少量水洗 inner surface of beaker has to be washed with small amt. of water

↓heat，硫酸白煙 10分間↑ for about 10 minutes you will have sulphuric in a form of smoke

↓冷却後，+H_2O 70ml after cool add 70 ml water

↓流水で冷却 Cool with flowing water.

ジョンズ還元器 30ml/min 以下で通過 at a rate of less than 30 ml/minute pass ______ through the jones reduction vessel.

砂皿上で蒸発乾固 See left

↓冷却 Cool.

↓+HCl 5〜10ml add 5-10 ml of HCl

↓砂皿上で heat，溶解 Heat and dissolve on sandy surface

↓+HCl 20ml

↓+H_2O 60ml

↓約1分間煮沸 Boil about 1 minute

↓冷却後 Cool

鉛還元器 60〜80ml/min で通過 pass ______ through lead reduction vessel at a rate of 60-80 ml/minute

↓HCl (1+11) 80ml 洗 Wash with 80 ml of HCl (1+11)

重クロム酸カリウム法（ビュレット） heavy chromatic acid, using potassium method (pipette)

＊ N/100 硫酸第二セリウム標準溶液で滴定 〔標準溶液の消費量 [illegible]
繰返す〕

〔ジョンズ還元器〕-- Johns reduction vessel.

Hg 2~3g （1l ビーカー） in beaker.

↓ +HNO_3(1+1) 約20ml add Approx 20ml HNO_3(1+1).
加温溶解 heat & Dissolve.

↓ +H_2O 400~500ml add 400-500ml water.

↓ +粒状Zn (864~503μm) 80~100g （メッシュ） Add 80-100g Zinc in pellet form.

攪拌 1×6 Stir, agitate.

↓ アマルガム化後, H_2O 使し 気泡が入らぬよう… 〔約150cc〕 After it has become amalgamated, add 150cc of water, to prevent effervescence.

ガラス管 充てん （ジョンズ還元器） add to a glass tube (Johns reduction vessel) Then wash with H_2SO_4 (5+95) at a rate of less than 30ml per minute.

↓ H_2SO_4(5+95) 洗い, 30ml/min 以下

↓ 水洗い, 30ml/min 以下 Then wash in water at a rate of less than 30ml/minute.

受器取り替え （500ml 吸引フラスコ） Change the vessel to 500ml absorbtion flask.

↓ H_2SO_4(5+95) 90ml 洗 Wash with 90ml of H_2SO_4.

↓ H_2O 15ml 洗い Then wash with 15ml water.

受器中の溶液 Solution in the receptacle.

↓ 水洗した air 急激に通じる（5分間） for 5 minutes, rapidly pass air through solution air that has been washed with water.

↓ フェロイン指示薬 1ml Add 1ml of prescribed drug heroin(?).

↓ リン酸 2ml add 2ml sulphuric Acid [illegible]

＊ N/100 硫酸第二セリウム標準溶液で滴定 〔標準溶液の消費量が一定値になるまで洗浄操作繰返す

1 gram of test material. 100 mesh equivalent sieve Japan Industrial Standard Z 8801.

試料1g 秤量 (300ml ビーカー 100メッシュ相当のふるい. JIS Z 8801)

↓ $HCl(3)+HNO_3(1)$ 20~30ml (50ml 三角フラスコ) $HCl + HNO_3$ add 20-30 ml a 3 sided flask, then heat.

↓ heat

↓ $H_2SO_4(1+1)$ 20ml + $HClO_4$ 5ml (50ml 三角フラスコ) Add H_2SO_4 (20ml) and 5ml $HClO_4$ to 50ml 3 side flask. Then heat.

↓ heat [硫酸白煙発生] It will produce white clouds of sulphuric acid.

↓ cooling

↓ $HNO_3(1+4)$ 約50ml (50ml 三角フラスコ) add about 50ml of HNO_3 to a 3 [illegible] flask.

↓ heat, 煮沸 Heat & Boil.

Absorbtion filter, absorbtion flask 250ml, Kiriyama funnel

X 吸引ろ過 (吸引フラスコ 250ml, 桐山ロート) ←

↓ 温水洗浄 Wash with warm water.

↓ 不溶解残留物除去 remove undissolved residue.

ろ液 約250ml 希釈 (500ml ビーカー) 3 solutions about 250ml, dilute (500ml beaker).

↓ NH_3aq 過剰 (pHメータ or pH試験紙) [硫酸酸性の場合 +NH_4Cl 約5g] excess of NH_3Aq (pH meter or pH litmus paper) add 5 g of NH_4Cl if sulphuric acid is indicated.

↓ 煮沸 Boil.

X 吸引ろ過 (吸引フラスコ 500ml, 桐山ロート)

沈殿物 (300ml ビーカー) sediment 300ml beaker.

↓ 温HCl(1+3)溶解 (100ml 三角フラスコ) Using a 100ml Triangular flask, melt with Warmed ~~too~~ HCl.

液量100ml 100ml liquid.

↓ +NH_3aq add NH_3Aq

再沈殿・吸引ろ過 (吸引フラスコ 250ml or 500ml, 桐山ロート) Then sediment re-occurs Absorbtion filter (absorbtion flask 250ml or 500ml, Kiriyama funnel

沈殿物 Sediment.

↓ 温水洗浄後, 元のビーカーに吹き落とす After washing with warm water, return to original beaker by blowing (vacuum?). [illegible] 可? ok

↓ 60% $HClO_4$ 15ml, 水約50ml Add 60% $HClO_4$ (15ml) and about 50ml water.

煮沸溶解 [沈殿が[illegible]時に HCl 5ml 添加. 引き続き上で白煙が生ずるまで加熱溶解] ?

↓ melt by boiling

液量100ml 100 ml of liquid.

↓ +Na_2SO_3 約0.2g add 0.2 g Na_2SO_3

↓ 煮沸(亜硫酸ガス追い出す) ...... check. Boil, in order to get rid of Sulphurous acid. Check

↓ [illegible] 4ml [沈殿がないとき適量添加] repeatedly pass through if there no sediment.

↓ 1分間煮沸 Boil for one minute.

↓ 少量の濾紙パルプ ...... check you will get a small quantity of pulp (type not known).

X 吸引ろ過 (吸引フラスコ 250ml, 桐山ロート)

↓ 冷水洗浄 Clean with water (cold).

ろ液 (300ml ビーカー) 3 solutions (300ml beaker).

| 数分間煮沸 (H_2S除去) Boil for several minutes to remove H_2S.

APPENDIX 12

白寿
ARMS

CONFIDENTIAL MEDICAL REPORT

I attend the Australian Federal Police building (19 Murray Street, Perth) at 10.30am on Friday 26 May 1995.

I am shown several sheep skulls:

1. **Labelled : Skull Sample 5**

   A skull which shows sun-bleaching of the left side and back, with some yellow/brown colouration (with remnants of brown coloured dirt) on the right side. In the centre of the back of the skull is a circle of depressed fracture, approximately 4 x 2.5cm in size. The depressed fracture plate is further fractured longitudinally; there are no specific features.

   No soft tissue remains. Examination of the inside of the skull shows no residual brain, and no obvious blood clot

2. **Unlabelled Skull**

   The skull is similar in appearance to the previous specimen, showing sun-bleaching of the left side, top and part of the back of the skull, and with yellow/brown colouration and residual sand on the right side.

   In the centre of the top/back of the skull is an approximately circular - profile, ring fracture, 40 x 30mm. There is slight depression of the plate of the fractured bone on the right side and posteriorly. Extending from the right rear side is a further linear fracture towards the right occipital region, 5cm in length.

   No soft tissue/haemorrhage is seen.

3. **Labelled : Skull Sample 6**

   This skull showed generalised yellow/brown colouration, with some remnants of mummified tissue and wool.

   In the centre of the top of the skull is a shield-like defect, approximately 60 x 40mm in size. Within the skull cavity is the displaced piece of bone. On the inner aspect of the bone of the right occipital region of the skull cavity is a thin layer of red/brown coloured material, which may be blood.

4. **Labelled : Skull Sample 28**

   The specimen is a skull, including lower jaw, with wool, some of which is partly attached to the top of the skull.

   In the centre of the back of the skull is a transversely orientated, oval-shaped defect, approximately 65 x 35mm. On the inner aspect of the bone of the right occipital region of the skull cavity is a thin layer of red/brown coloured material, which may be blood. The missing piece of skull bone is not found.

CONCLUSION

Sheep Skulls:

1. Sub-total or total skeletalisation.
2. Evidence of blunt-force injury, consistent with a flat hammer-head.
3. Possible intracranial haemorrhage in two of the examined skulls.

Dr C. T. Cooke, MBBS, BMedSci, FRCPA
Chief Forensic Pathologist

26 May 1995

CTC/mc

APPENDIX 15

CHEMISTRY
CENTRE

WA93/0816
Your Ref. 94F3272
Our Ref. R C Hansson
Enquiries to.
Telephone.

B O'Shaughnessy
Detective Acting Superintendent
Australian Federal Police
P O Box 586
WEST PERTH WA 6872

DRAFT

Report on the examination of 59 items in connection with an investigation into the activities of the Aum Shinri Kyo sect at Banjawarn Station.

The items were collected by Mr R C Hansson of the Chemistry Centre(WA) in company with officers of the Australian Federal Police at Banjawarn Station on 11 May 1995. The items were transported to Perth by the Australian Federal Police and received at the Chemistry Centre(WA) on 25 May 1995.

Items received are listed in **Table 1.**

TABLE 1

LAB_NO	MARKS	SAMPLE
94F3272001	BJA/SAO 1	CONTROL WOOL SAMPLE
94F3272002	BJA/SAO 2	SOIL SAMPLE SECTION 1
94F3272003	BJA/SAO 3	WOOL SAMPLE SECTION 1
94F3272004	BJA/SAO 4	SOIL SAMPLE SECTION 1
94F3272005	BJA/SAO 5	WOOL SAMPLE SECTION 1
94F3272006	BJA/SAO 6	SOIL SAMPLE SECTION 2
94F3272007	BJA/SAO 7	WOOL SAMPLE SECTION 2
94F3272008	BJA/SAO 8	SOIL SAMPLE SECTION 2
94F3272009	BJA/SAO 9	WOOL SAMPLE SECTION 2
94F3272010	BJA/SAO 10	SOIL SAMPLE SECTION 3

94F3272011	BJA/SAO 11	WOOL SAMPLE SECTION 3
94F3272012	BJA/SAO 12	SOIL SAMPLE SECTION 3
94F3272013	BJA/SAO 13	WOOL SAMPLE SECTION 3
94F3272014	BJA/SAO 14	SOIL SAMPLE SECTION 4
94F3272015	BJA/SAO 15	WOOL SAMPLE SECTION 4
94F3272016	BJA/SAO 16	SOIL SAMPLE SECTION 4
94F3272017	BJA/SAO 17	WOOL SAMPLE SECTION 4
94F3272018	BJA/SAO 18	SOIL SAMPLE SECTION 5
94F3272019	BJA/SAO 19	WOOL SAMPLE SECTION 5
94F3272020	BJA/SAO 20	SOIL SAMPLE SECTION 5
94F3272021	BJA/SAO 21	WOOL SAMPLE SECTION 5
94F3272022	BJA/SAO 22	SOIL SAMPLE SECTION 6
94F3272023	BJA/SAO 23	WOOL SAMPLE SECTION 6
94F3272024	BJA/SAO 24	SOIL SAMPLE SECTION 6
94F3272025	BJA/SAO 25	WOOL SAMPLE SECTION 6
94F3272026	BJA/SAO 26	SOIL SAMPLE SECTION 7
94F3272027	BJA/SAO 27	WOOL SAMPLE SECTION 7
94F3272028	BJA/SAO 28	SOIL SAMPLE SECTION 7
94F3272029	BJA/SAO 29	WOOL SAMPLE SECTION 7
94F3272030	BJA/SAO 30	SOIL SAMPLE SECTION 8
94F3272031	BJA/SAO 31	WOOL SAMPLE SECTION 8
94F3272032	BJA/SAO 32	SOIL SAMPLE SECTION 8
94F3272033	BJA/SAO 33	WOOL SAMPLE SECTION 8
94F3272034	BJA/SAO 34	SOIL SAMPLE SECTION 9
94F3272035	BJA/SAO 35	WOOL SAMPLE SECTION 9
94F3272036	BJA/SAO 36	SOIL SAMPLE SECTION 9
94F3272037	BJA/SAO 37	WOOL SAMPLE SECTION 9

94F3272038	BJA/SAO 38	SOIL CONTROL 15 M S/EAST
94F3272039	BJA/SAO 39	SOIL CONTROL 25M S/EAST
94F3272040	BJA/SAO 40	WHITE PLASTIC SHEEP EAR TAG
94F3272041	BJA/SAO 41	GREEN PLASTIC SHEEP EAR TAG
94F3272042	BJA/SAO 42	SPHERICAL OBJECT - SECTION 8
94F3272043	BJA/SAO 47	SOIL CONTROL - GOAT SITE
94F3272044	BJA/SAO 48	SOIL FROM PORTABLE FENCE
94F3272045	BJA/SAO 49	RUBBER FROM PORTABLE TRAILER
94F3272046	BJA/SAO 50	IMMOBILISED LIQUID - TIP
94F3272047	BJA/SAO 60	WOOL & TAG - CULLING AREA 1
94F3272048	BJA/SAO 61	SOIL - CULLING AREA 1
94F3272049	BJA/SAO 62	WOOL & TAG - CULLING SITE 2
94F3272050	BJA/SAO 63	SOIL - CULLING SITE 2
94F3272051	BJA/SAO 73	WATER TROUGH QUARTZ WELL
94F3272052	BJA/SAO 74	WATER TANK QUARTZ WELL
94F3272053	BJA/SAO 75	WATER TROUGH QUARTZ WELL
94F3272054	BJA/SAO 76	SOIL FROM QUARTZ WELL
94F3272055	BJA/SAO 77	KANGAROO HIDE - QUARTZ WELL
94F3272056	BJA/SAO 92	SOIL FROM NECKERSGAT RANGES
94F3272057	BJA/SAO 98	SOIL OUTLET FROM LAB. SINK
94F3272058	BJA/SAO 99	SOIL OUTLET FROM LAB. SINK
94F3272059	BJA/SAO 100	SOIL OUTLET FROM LAB. SINK

METHOD OF EXAMINATION

The items were examined for the presence of methylphosphonic acid (MPA) using a modification of a method described by Black et al in the Journal of Chromatography A, 662 (1994) 301-321.

The modification involved the use of tetramethylammonium hydroxide as derivatising agent rather than N-(tert-butyldimethylsilyl)-N-methytrifluoroacetamide (MTBSTFA) and was required because of interferences and irregularities encountered when using MTBSTFA.

Gas chromatography -mass spectroscopy was performed on a VG TS-250 Mass Spectrometer with 70 EV electron ionisation at a resolution of 500, operating in the selected ion recording mode.

Detection of the dimethyl derivative of methylphosphonic acid was established by monitoring the major fragment ions at masses 124,031, 109.007, 93.963, 78.939, and 62.915. The EI spectra of the derivative is shown in Appendix 1.

Identification of dimethyl methylphosphonic acid was established when the retention time and the fragment ion ratios from the sample was the same as a standard run under the same conditions in the same analytical batch.

Reagent blanks and control samples were run with every analytical batch.

RESULT OF EXAMINATION

Control samples

MPA was not detected in wool sample BJA/SAO1 and soil samples BJA/SAO 38, 39, 47, 48 (Lab No's 94F3272001, 38, 39, 43, 44).

Samples From Dead Sheep Site

MPA was detected in the following samples

Wools	BJA/SAO 5, 9, 13, 17, 21, 25, 29, 33, 37. (Lab No's 94F3272005, 9, 13, 17, 21, 25, 29, 33, 37).
Soils	BJA/SAO4, 8, 12, 16, 20, 24, 28, 32, 36. (Lab No's 94F3272004, 8, 12, 16, 20, 24, 28, 32, 36).

The following samples were not examined:

Wools	BJA/SAO 3, 7, 11, 15, 19, 23, 27, 31, 35. (Lab No's 94F3272003, 7, 11, 15, 19, 23, 27, 31, 35).
Soils	BJA/SAO 2, 6, 10, 14, 18, 22, 26, 30, 34. (Lab No's 94F3272002, 6, 10, 14, 18, 22, 26, 30, 34).

Ear Tabs BJA/SAO 40, 41 (Lab No's 94F3272040, 41).

Spherical Object BJA/SAO 42 (Lab No. 94F3272042).

Miscellaneous Samples

MPA was not detected in the liquid sample BJA/SAO 50 (Lab No. 94F3272046).

The rubber sample BJA/SAO 49 (Lab No. 94F3272045) was not examined.

Culling Site samples

MPA was detected in wool samples BJA/SAO 60, 62, (Lab No's 94F3272047, 49) and soil samples BJA/SAO 61, 63 (Lab No's 94F3272048, 50).

Quartz Well Samples

MPA was not detected in water and soil samples BJA/SAO 73, 74, 75, 76 (Lab No's 94F3272051, 52, 53, 54).

The kangaroo hide sample BJA/SAO 77 (Lab No. 94F3272055) was not examined.

Neckersgat Ranges Sample

MPA was not detected in soil sample BJA/SAO 92 (Lab No. 94F3272056).

Laboratory Sink Outlet Samples

MPA was detected in soil sample BJA/SAO 99 (Lab No. 94F3272058).

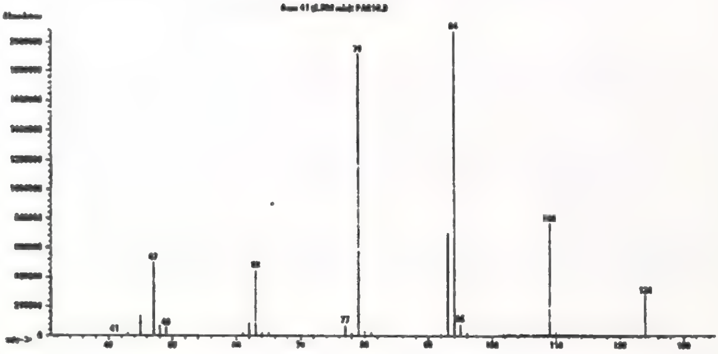
MPA was not detected in soil samples BJA/SAO 98, 100 (Lab No's 94F3272057, 59).

Robert Charles Hansson
PRINCIPAL CHEMIST
FORENSIC SCIENCE LABORATORY

Peter Andrew Collins
CHEMIST & RESEARCH OFFICER
FORENSIC SCIENCE LABORATORY

18 August, 1995

Appendix 1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1200000
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800000
600000
400000
200000
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41
47
49
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77
79
94
96
109
124
40
50
60
70
80
90
100
110
120
130

APPENDIX 16

NERVE AGENTS

	OFFENCES	POWERS	
Chemical Weapons (Prohibition) Act 1994	S.12. Offences relating to chemical weapons S.13. Notification of Ending of substances or articles believed to be chemical weapons S.77. Production etc of Scheduled chemicals otherwise than in accordance with permit S.78. Breach of condition of permit S.79. Interference with monitoring equipment S.80. False or misleading statements and documents	S.14. Forfeiture and seizure of chemical weapons Warrants S.57.Offence-related searches and seizures S.58.Offence-related warrants S.59. The things that are authorised by search warrant S.60. Specific powers available to national inspectors executing warrants S.61. Use of equipment to examine or process things S.62. Use of electronic equipment at premises S.63. Warrants by telephone or other electronic means S.64. Retention of things that are seized Miscellaneous provisions relating to warrants S.66 Announcement before entry S.67 Availability of assistance and use of force in executing warrant S.68. Details of warrant to be given to occupier etc. S.69. Copies of seized things to be provided	**MAKE** **USE**

NERVE AGENTS

	OFFENCES	POWERS	
Weapons of Mass Destruction (Prevention of Prolif.) Act 1995	S.9. Prohibition on supplying goods for WMD program S.10. Prohibition on exporting goods for WMD program S.11. Prohibition on providing services for WMD program (Plus offences as per 6,7 & 7A Crimes Act 1914)	S.17. Forfeiture of goods	IMPORT EXPORT

BIOLOGICAL

	OFFENCES	POWERS	
Crimes (Biological Weapons) Act 1976.	S.8. Restriction on development etc. of certain biological agents and toxins and biological weapons	S.9. Forfeiture and seizure S.10(4)(1)(b) Power of Arrest/ Arrest warrant.	**MAKE**

NUCLEAR

	OFFENCE	POWERS	
Nuclear Non-Proliferation (Safeguards) Act 1987.	S.23. Possession of nuclear material or associated item without permit S.25. Breach of condition of permit or authority, &c. S.27. Minister to be given certain notices re.exempt nuclear material S.28. Interference with containment or surveillance devices S.29. Information in relation to design for construction or modification of nuclear facility S.30. False or misleading statements, &c. S.31. Obstruction of Agency inspector Offences Re: Physical Prot. Convention S.33. Stealing nuclear material S.34. Demanding nuclear material by threats, &c. S.35. Use of nuclear material causing injury to persons or damage to property S.36. Threat to use nuclear material S.37. Threat to commit offence S.38. Extension of appl. of offence provisions outside Aust.	S.59. Safeguards inspections by inspectors S.60. Safeguards inspections by Agency inspectors S.61. Offence-related searches and seizures S.62 Warrants may be granted by telephone S.63. Emergency searches and seizures S.67. Seizure of nuclear material, &c., where required by prescribed international agreement S.70. Powers to be exercised in accordance with international agreements.	USE MAKE

APPENDIX 18

PSYCHOLOGICAL PROFILE

A general psychological assessment was prepared by an Australian Federal Police psychologist who suggested that there is no specific psychological profile that would predict a person's susceptibility for recruitment to the sect, although many sect members would have their personal, emotional, social and intellectual needs satisfied.

The recruitment of members could target people experiencing an existential or personal crisis which would provide an illusion of support, meaning, value or power. Systematic recruitment identifies certain characteristics such as co-dependency. Once people are recruited, sects use specific processes to maintain the illusion to manipulate their followers. Some powerful techniques include, mind distorting narcotics, alienation from alternative viewpoints, indoctrination regimes and rigid role assignment are employed.

Other cult specialists believe that "the lack of a father figure in the home leads the young towards cults with strong male leadership".

EMERGING ISSUES

Australia has a variety of federal and state laws that could be applied in the event of an incident such as the Tokyo sarin gas attack taking place in Australia. Prosecutions for loss of life and associated offences against the person are clear. More complex issues emerge when crimes relating to chemical, biological and nuclear material cross international boundaries. Currently Australian federal legislation for dealing with crime relating to biological and nuclear incidents is adequate for military incidents but amendments for non-military incidents are necessary.

Australia established the Chemical Weapons Convention Office to administer the International Chemical Weapons Convention Treaty which cannot be enacted until 65 of the 169 participating countries ratify it. Currently, 36 countries have signed ratification and it is expected that ratification will be complete by late 1996.

Australian federal law-enforcement agencies are responsible for enforcing laws in relation to constitutional requirements for foreign nationals, immigration and the influx of criminals. The Australian Joint Standing Committee on Migration inquiry into Australia's visa system for visitors to Australian is considering three options:

- abolition of the requirement for all visitors to obtain a visa before travelling to Australia;
- abolition of requirement for selected nationals; and
- maintain the existing system but make it more efficient.

Law-enforcement agencies put forward the view that all visitors must be cleared to enter Australia before they depart their country of origin. This can be achieved by sophisticated information collection, manipulation and communication which addresses privacy, bilateral relations and data-matching implications. This has occurred primarily for tourism and trade.

BIOSYM Technologies

Molecular Simulations

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 19

VIA FAX

October 26, 1995

Mr. Scott Newton
United States Senate
Committee on Governmental Affairs
Minority Permanent Subcommittee on Investigations
Washington, DC 20510

Dear Scott:

As we discussed on the phone and in response to the October 24 letter of Dan Gelber, attached are the following documents relating to Biosym's contacts with AUM Corp.:

1. Non-Disclosure Agreement relating to the software evaluated;
2. Shipping Authorization Form;
3. Initial Shipping Order (3/1/95);
4. Shipping Confirmation;
5. Revised Shipping Order(3/15/95);
6. Quotation for Computer Hardware;
7. AUM Corp. Purchase Order for the Hardware;
8. Biosym License Purchase Agreement;
9. Computer Registration Form;
10. Order Approval Form; and
11. Customer Status Checklist.

Please do not hesitate to contact me if you have any questions about the attached documentation or if you require further assistance in connection with your examination of AUM.

Sincerely,

Tom Carney

Thomas M. Carney
Corporate Counsel

BIOSYM/Molecular Simulations • 9685 Scranton Road, San Diego, California USA 92121-3752 • (619) 458-9990 Fax: (619) 458-0136

BIOSYM TECHNOLOGIES, INC
NON-DISCLOSURE AGREEMENT

SW to be sent here!?

Between BIOSYM Technologies, Inc.
a California Corporation
9688 Scranton Avenue
San Diego, CA 92121
(BIOSYM)

And Dr. Y. Hiramatsu
AUM Corp.
6 East 48th St.
New York NY 10017
(RECIPIENT)

PA378

WHEREAS RECIPIENT wishes to do an Evaluation of the following software including documentation for a period of 30 days

---

LIFE SCIENCES
- ☑ Insight II
- ☑ Insight XPress
- ☑ Discover
- ☑ BioPolymer
- ☑ Analysis
- ☑ Delphi
- ☑ Homology
- ☑ Open Interface
- ☑ Sketcher
- ☑ Search/Compare
- ☑ DeCipher
- ☑ Consensus
- ☑ Converter
- ☑ Apex 3D
- ☑ Ludi
- ☑ Profiles 3D

NMR
- ☑ Felix 2D
- ☑ Felix ND
- ☑ Felix Assign
- ☑ Felix Model
- ☑ Felix X-Remote
- ☑ Felix for Windows
- ☑ NMR Refine Advance
- ☑ NMR Refine DGII

7 ind

QUANTUM
- ☑ DMol
- ☑ Turbomole
- ☑ TurboNMR

POLYMER
- ☐ Amorphous Cell
- ☐ Crystal Cell
- ☐ Interphases
- ☐ Networks
- ☐ Phase Diagram
- ☐ Polymerizer
- ☐ PolyNMR
- ☐ PRISM
- ☐ QSPR
- ☐ RIS
- ☐ Synthia
- ☐ Viscoelasticity
- ☐ Flexiblend
- ☐ Polymer Consortium

BOM
- ☐ Plane Wave
- ☐ ESOCS
- ☐ DSolid
- ☐ AXXESS

SOLID STATE
- ☐ Solids Builder
- ☐ Solids Adjustment
- ☐ Solids Embed
- ☐ Solids Simulation
- ☐ Characterize
- ☐ Char-Geom
- ☐ Diffraction
- ☐ Solids NMR
- ☐ Morphology
- ☐ IR RAMAN
- ☐ EXAFS
- ☐ Structure Image
- ☐ Structure Solve
- ☐ Structure Refine
- ☐ Solids Docking
- ☐ Sorption
- ☐ Reaction Patterns
- ☐ Catalysis Consortium

X-PRESS
- ☐ Xpress Analysis
- ☐ Xpress Biopolymer
- ☐ Xpress Polymerizer
- ☐ Xpress QSPR
- ☐ Xpress Search/Compare
- ☐ Xpress Sketcher

1

28/FEB/'95

on a SINGLE CPU, NOW, THEREFORE, BIOSYM and RECIPIENT, for their mutual benefit, hereby agree as follows:

The term "Software" as used herein shall mean the computer programs, derivative works and support material including but not limited to documentation, manuals, flow charts, specifications and training materials related thereto.

BIOSYM shall deliver Software to RECIPIENT at no charge for the sole purpose of evaluating Software's capabilities with full support from BIOSYM. RECIPIENT's right to use Software is nontransferable and nonexclusive and shall be limited solely to RECIPIENT's evaluation at RECIPIENT's location at the above address or as otherwise stated in this Agreement. RECIPIENT must pay shipping and handling import duties if applicable.

Title and full ownership rights to Software remain solely with BIOSYM and the Software is asserted to be BIOSYM's proprietary information and trade secret. RECIPIENT shall make no copies of the Software.

Software, documentation and other written material supplied by BIOSYM shall be held in confidence by RECIPIENT, using at least the same degree of care it uses to protect its own proprietary information, and shall be disclosed only to employees of RECIPIENT directly concerned with the evaluation. RECIPIENT shall appropriately notify each employee to whom any such disclosure is made that such disclosure is made in confidence and shall be kept in confidence by the employee, and RECIPIENT shall take whatever steps are necessary to assure that such employee keeps such confidence.

The obligations of RECIPIENT shall not apply to any information which it can be demonstrated:

a. has become part of the public domain other than by acts or omissions of RECIPIENT;

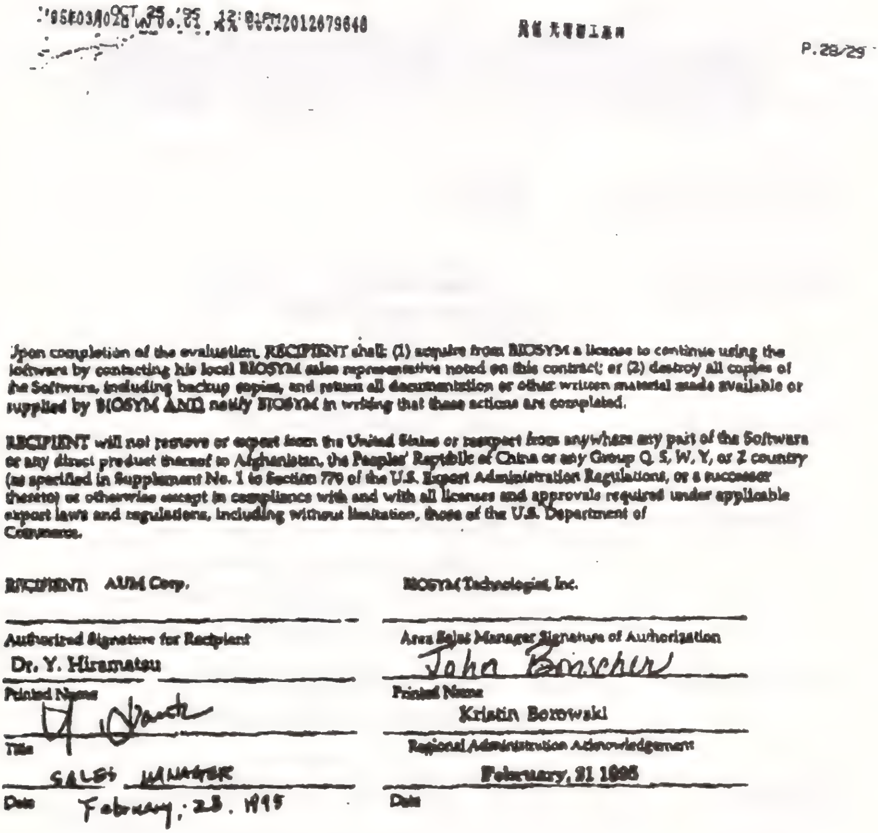
b. has been furnished or made known to RECIPIENT by third parties (other than those acting on behalf of BIOSYM) as a matter of legal right and without restriction on disclosure or use; or

c. was in the possession of RECIPIENT prior to disclosure by BIOSYM and was not acquired directly or indirectly from BIOSYM.

This obligation of confidentiality shall continue without regard to the termination of this Agreement until the Software becomes a part of the public domain, without a breach of this Agreement by RECIPIENT.

SOFTWARE IS PROVIDED WITH NO WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. AND BIOSYM SHALL HAVE NO LIABILITY TO RECIPIENT OR ANY OTHER PARTY WITH REGARD TO ITS USE AND PERFORMANCE DURING THE PERIOD OF THIS AGREEMENT AND IN NO EVENT SHALL BIOSYM BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

2 28/FEB/95



'95年03月02日 OCT 25 '95 12:01PM 2012679648 [illegible] P.28/29

Upon completion of the evaluation, RECIPIENT shall: (1) acquire from BIOSYM a license to continue using the Software by contacting his local BIOSYM sales representative noted on this contract; or (2) destroy all copies of the Software, including backup copies, and return all documentation or other written material made available or supplied by BIOSYM AND notify BIOSYM in writing that these actions are completed.

RECIPIENT will not remove or export from the United States or reexport from anywhere any part of the Software or any direct product thereof to Afghanistan, the Peoples' Republic of China or any Group Q, S, W, Y, or Z country (as specified in Supplement No. 1 to Section 770 of the U.S. Export Administration Regulations, or a successor thereto) or otherwise except in compliance with and with all licenses and approvals required under applicable export laws and regulations, including without limitation, those of the U.S. Department of Commerce.

RECIPIENT: AUM Corp.

Authorized Signature for Recipient

Dr. Y. Hiramatsu

Printed Name

Title

SALES MANAGER

Date February, 23. 1995

BIOSYM Technologies, Inc.

Area Sales Manager Signature of Authorization

John Borscher

Printed Name

Kristin Borowski

Regional Administration Acknowledgement

February, 21 1995

Date

EXPEDITED SHIPPING AUTHORIZATION FORM

Date of Shipment: 3/1/95

Requested by: John Brescher

BIOSYM TECHNOLOGIES, INC.
4 CENTURY DRIVE
SECOND FLOOR
PARSIPPANY, NJ 07054

Shipped by:

BIOSYM TECHNOLOGIES, INC.
9685 SCRANTON ROAD
SAN DIEGO, CA 92121-2777

Shipped to:

Biosym
4 Century Drive
Parsippany, NJ 07054
ATTN: Lisa Hetherington

Justification: Final SW PA 378 to be loaded by Brian Kell

Shipped: OVERNIGHT ✓ OTHER ___

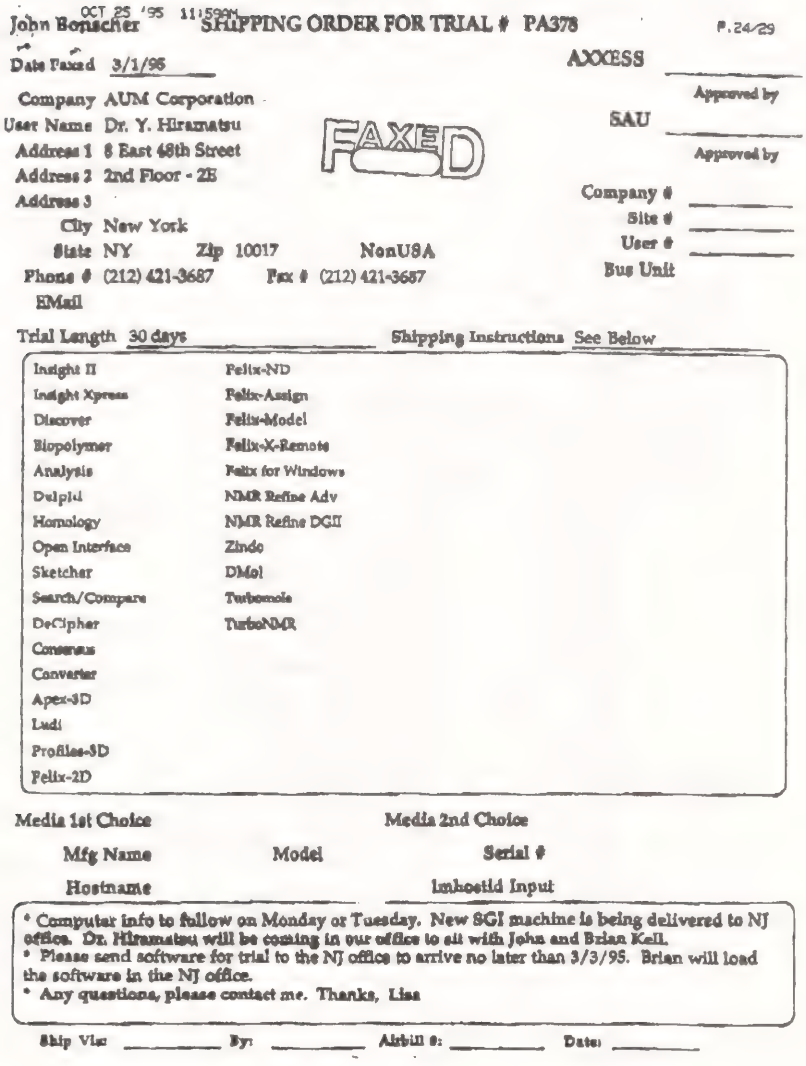
Airbill #: ___

Weight: ___

Price: ___

VP approval: Robert

Bill To Department #: 412/400



OCT 25 '95 11:59AM P.24/29

John Bonscher

SHIPPING ORDER FOR TRIAL # PA378

Date Faxed 3/1/95

AXXESS ______ Approved by

SAU ______ Approved by

FAXED

Company AUM Corporation
User Name Dr. Y. Hiramatsu
Address 1 8 East 48th Street
Address 2 2nd Floor - 2B
Address 3
City New York
State NY Zip 10017 NonUSA
Phone # (212) 421-3687 Fax # (212) 421-3657
EMail

Company # ______
Site # ______
User # ______
Bus Unit

Trial Length 30 days

Shipping Instructions See Below

Insight II
Insight Xpress
Discover
Biopolymer
Analysis
Delphi
Homology
Open Interface
Sketcher
Search/Compare
DeCipher
Consensus
Converter
Apex-3D
Ludi
Profiles-3D
Felix-2D

Felix-ND
Felix-Assign
Felix-Model
Felix-X-Remote
Felix for Windows
NMR Refine Adv
NMR Refine DGII
Zindo
DMol
Turbomole
TurboNMR

Media 1st Choice

Media 2nd Choice

Mfg Name

Model

Serial #

Hostname

lmhostid Input

* Computer info to follow on Monday or Tuesday. New SGI machine is being delivered to NJ office. Dr. Hiramatsu will be coming in our office to sit with John and Brian Kell.

* Please send software for trial to the NJ office to arrive no later than 3/3/95. Brian will load the software in the NJ office.

* Any questions, please contact me. Thanks, Lisa

Ship Via: ______ By: ______ Airbill #: ______ Date: ______

Mar.03 OCT 25 '95 12:01PM by: BIOSYM_RCenter [illegible] P.29/29

```
                              SHIPPING CONFIRMATION

SHIPPED DATE 01-MAR-95                              SHIP LOG # 95-13375
                                                    RELEASE:    235
TO: AUM CORPORATION
    DR. Y. HIRAMATSU
    8 EAST 48TH STREET
    2ND FLOOR-2E

    NEW YORK  NY         10017  USA
    PHONE: 212-421-3687
    COMMENTS: Trial#PA378 SR#39984
    SHIP TYPE: T  (N=New T=Trial S=Special M=Maint)
    SHIP TO USER NUM:  3613. 1. 1
    SALES: BONSCHER
    ------------------------------------------------------------------
    SHIPPED VIA: D (D=DHL U=UPS F=FedEx M=Mail O=Other)
    SHIPPER NUMBER: 7542815405
    SHIP DATE: 01-MAR-95
    ------------------------------------------------------------------
    ITEM# QTY  PRODUCT          DESCRIPTION
    ------------------------------------------------------------------
      1    1   INSIGHT II        235 General Cover Letter Packet
     16    1   FELIX-ND          235C Felix Cover Letter Packet
     12    1   APEX-3D           Apex 3-D 1.4 User Guide
     11    1   CONSENSUS         Consensus 2.3 User Guide
     22    1   DMOL              DMol 2.3.5 User Guide
     10    1   DECIPHER          DeCipher 2.3 User Guide
      7    1   DELPHI            DelPhi and Solvation 2.5 User Guide
      4    1   DISCOVER          Discover 2.95/94.0 User Guide
      5    1   DISCOVER          Discover Cover Letter
     17    1   FELIX-ND          Felix 2.3 Command Reference/User Guide
     18    1   FELIX-ASSIGN      Felix Assign Cover Letter Packet
     19    1   FELIX-ASSIGN      Felix Assign User Guide
     13    1   LUDI              Fragment Libraries
      2    1   INSIGHT II        Insight II 2.3 User Guide
      3    1   INSIGHT II        Insight II Command Guide and Index
      6    1   INSIGHT XPRESS    Insight-Xpress 2.3 User Guide
     14    1   LUDI              Ligand Design 2.3 User Guide
     20    1   NMR REFINE ADVA   NMRchitect 2.3 User Guide
      8    1   OPEN INTERFACE    Open Interface 2.30 Programmer Guide
     15    1   PROFILES-3D       Profiles-3D 2.3 User Guide
      9    1   SKETCHER          Search_Compare & Sketch/Converter 2.3 User Gu
de

     23    1   TURBOMOLE         Turbomole 2.3 User Guide
     21    1   SINDO             Sindo 94.0 User Guide
    ------------------------------------------------------------------
    ITEMS ON BACK ORDER WITH THIS SHIP LOG#
    ITEM# QTY/BO  PRODUCT          DESCRIPTION
    ------------------------------------------------------------------


--------------------------------------------------------------------
SHIP LOG: 95-13375                                  Page 2     of 6
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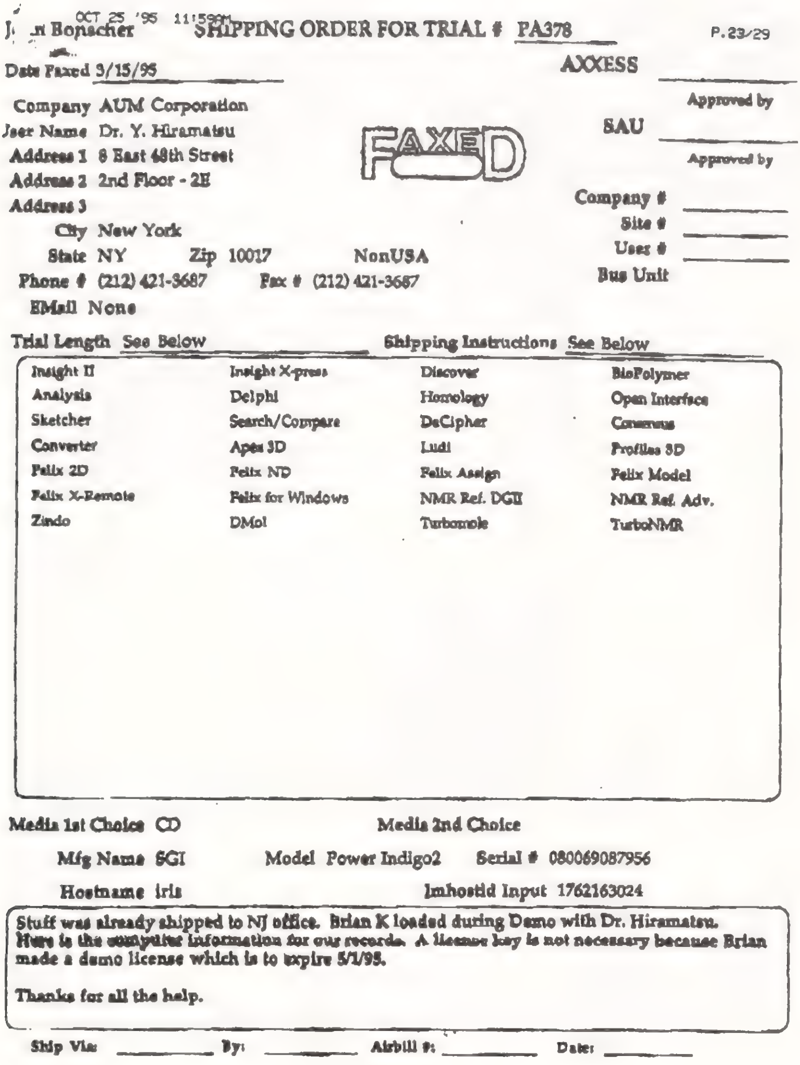


OCT 25 '95 11:59AM
J n Bonacher **SHIPPING ORDER FOR TRIAL #** PA378 P.23/29

Date Faxed 3/15/95

AXXESS ____________
Approved by

SAU ____________
Approved by

Company AUM Corporation
User Name Dr. Y. Hiramatsu
Address 1 8 East 48th Street
Address 2 2nd Floor - 2E
Address 3
City New York
State NY **Zip** 10017 **NonUSA**
Phone # (212) 421-3687 **Fax #** (212) 421-3687
EMail None

FAXED

Company # ____________
Site # ____________
User # ____________
Bus Unit

Trial Length See Below **Shipping Instructions** See Below

Insight II
Analysis
Sketcher
Converter
Felix 2D
Felix X-Remote
Zindo

Insight X-press
Delphi
Search/Compare
Apex 3D
Felix ND
Felix for Windows
DMol

Discover
Homology
DeCipher
Ludi
Felix Assign
NMR Ref. DGII
Turbomole

BioPolymer
Open Interface
Consensus
Profiles 3D
Felix Model
NMR Ref. Adv.
TurboNMR

Media 1st Choice CD **Media 2nd Choice**

Mfg Name SGI **Model** Power Indigo2 **Serial #** 080069087956

Hostname iris **lmhostid Input** 1762163024

Stuff was already shipped to NJ office. Brian K loaded during Demo with Dr. Hiramatsu. Here is the computer information for our records. A license key is not necessary because Brian made a demo license which is to expire 5/1/95.

Thanks for all the help.

Ship Via: ____________ **By:** ____________ **Airbill #:** ____________ **Date:** ____________

Quotation For:
AUM CORPORATION
Dr. Y. Hiramatsu
8 East 48th Street
2nd Floor - 2E
New York, NY 10017

Biosym Technologies, Inc.
4 Century Drive
Parsippany, New Jersey 07054
Telephone Number: 201-267-4476
FAX Number: 201-267-9648

Telephone Number: (212) 421-3687
Fax Number: (212) 421-3687
E-Mail Address:

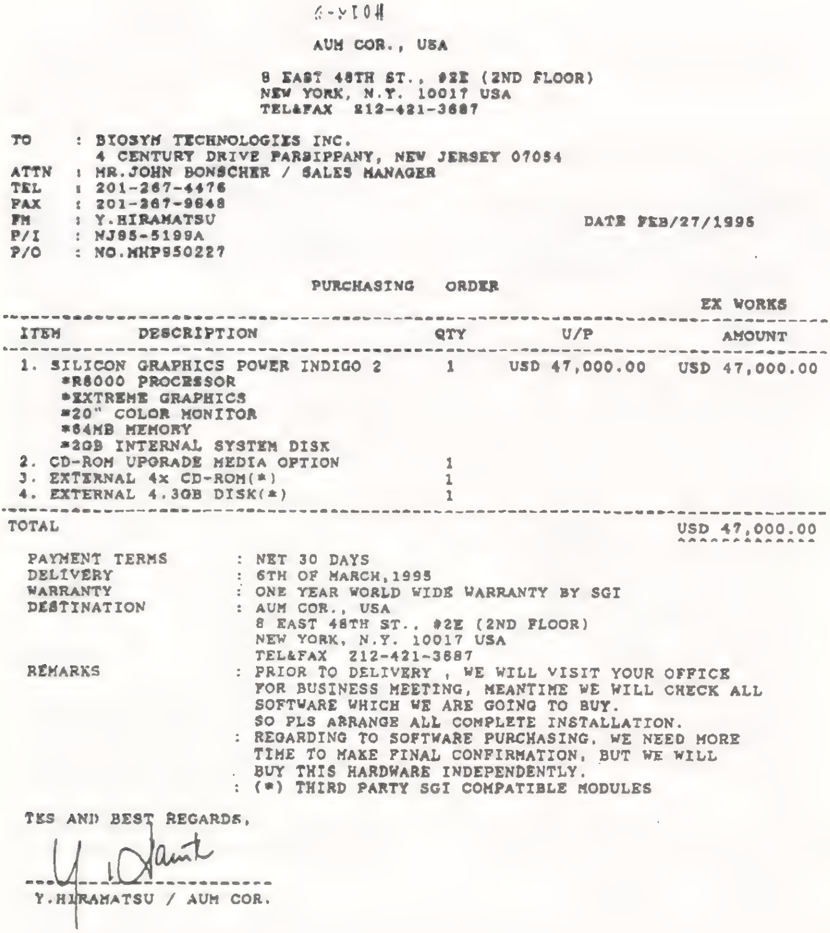
Sales Manager: John Bonscher
Proposal #: NJ95-5199A
Date: Feb 27, 1995
Quote Valid Until: Mar 31, 1995
Currency: US$

QTY	Part Number	Hardware Description	Unit Price	Disc. %	Extended Price	Hardware Warranty	Disc. %	Extended Warranty	TOTAL Price
1	WB-TWOTFPEX2	Power Indigo2 R8000, Extreme Graphics, 64MB, 2GB System Disk, 20' Monitor	$57,500	31%	$39,675	$3,725	0%	$3,725	$43,400
1	MO5-CD	CD-ROM Update Media Option	$0	0%	$0	$240	0%	$240	$240
1	#	External 3.5" FF 4.3GB Fast SCSI Option Disk For Indigo2	$2,660	0%	$2,660	$0	0%	$0	$2,660
1	#	CD-ROM External SCSI 4x Drive	$700	0%	$700	$0	0%	$0	$700
		GRAND TOTAL	$60,860		$43,035	$3,965		$3,965	$47,000

TERMS/CONDITIONS:
1. HARDWARE WARRANTY: (90) Days
2. PAYMENT TERMS: Net 30 days
3. FREIGHT CHARGES: (FOB origin) prepaid and added to your invoice.

NOTES:
Please reference this Proposal Number on your purchase order.

Third Party SGI Compatible Hardware Modules



6-¥IOH

AUM COR., USA

8 EAST 48TH ST., #2E (2ND FLOOR)
NEW YORK, N.Y. 10017 USA
TEL&FAX 212-421-3687

TO : BIOSYM TECHNOLOGIES INC.
4 CENTURY DRIVE PARSIPPANY, NEW JERSEY 07054
ATTN : MR.JOHN BONSCHER / SALES MANAGER
TEL : 201-267-4476
FAX : 201-267-9648
FM : Y.HIRAMATSU
P/I : NJ95-5199A
P/O : NO.MHP950227

DATE FEB/27/1995

PURCHASING ORDER

EX WORKS

ITEM	DESCRIPTION	QTY	U/P	AMOUNT
1.	SILICON GRAPHICS POWER INDIGO 2 *R8000 PROCESSOR *EXTREME GRAPHICS *20" COLOR MONITOR *64MB MEMORY *2GB INTERNAL SYSTEM DISK	1	USD 47,000.00	USD 47,000.00
2.	CD-ROM UPGRADE MEDIA OPTION	1		
3.	EXTERNAL 4x CD-ROM(*)	1		
4.	EXTERNAL 4.3GB DISK(*)	1		
TOTAL				USD 47,000.00

PAYMENT TERMS : NET 30 DAYS
DELIVERY : 6TH OF MARCH,1995
WARRANTY : ONE YEAR WORLD WIDE WARRANTY BY SGI
DESTINATION : AUM COR., USA
8 EAST 48TH ST., #2E (2ND FLOOR)
NEW YORK, N.Y. 10017 USA
TEL&FAX 212-421-3687
REMARKS : PRIOR TO DELIVERY , WE WILL VISIT YOUR OFFICE FOR BUSINESS MEETING, MEANTIME WE WILL CHECK ALL SOFTWARE WHICH WE ARE GOING TO BUY. SO PLS ARRANGE ALL COMPLETE INSTALLATION.
: REGARDING TO SOFTWARE PURCHASING, WE NEED MORE TIME TO MAKE FINAL CONFIRMATION, BUT WE WILL BUY THIS HARDWARE INDEPENDENTLY.
: (*) THIRD PARTY SGI COMPATIBLE MODULES

TKS AND BEST REGARDS,

Y. Hiramatsu

Y.HIRAMATSU / AUM COR.

Agreement No.: CI3226

BIOSYM Technologies, Inc.
License Purchase Agreement

ORIGINAL

Prepared for: AUM CORPORATION

BIOSYM Technologies, Inc. ("BIOSYM") and the undersigned ("Customer") agree that the following terms and conditions shall govern the licensing and maintenance of application software and operating system software and its associated documentation provided by BIOSYM, and technical services related thereto, and, the sale of equipment manufactured by third parties ("Equipment"), all as identified in the attachments listed in Paragraph 17.

1. **Definitions**

a) The term "Agreement" shall mean the terms and conditions herein, as well as the Attachments specified in Paragraph 17 and all future Addenda, if any.

b) The term "Software" shall mean collectively BIOSYM computer programs in machine executable code, derivative works and support material including but not limited to documentation, manuals, flow charts, specifications and training materials related thereto, including updates, modifications and new releases, as specified in the relevant Attachment.

c) The term "Server" shall mean a computer system on which software resides that can be accessed by other computer systems resident on a local network system.

d) The term "Designated System(s)" shall mean the specific CPU(s) or Server(s) on which the Software under this Agreement is intended to run, as specified in the relevant Attachment.

e) The term "Site" shall mean a computer system or systems composed of one or more CPUs that are located at the same physical address.

f) The term "Simultaneous Active Use" or "SAU" license shall mean a license to use the Software on a Server that can be accessed by other computer systems resident on a local network system as specified in the relevant Attachment.

g) The term "Software Maintenance" shall mean the software maintenance and support services described in Section 4.

2. License - BIOSYM hereby grants to Customer and Customer hereby accepts a nontransferable, nonsublicensable, nonexclusive right (the "License") to use the Software at a single Site within Customer's own organization with the specific CPU(s) or Server(s) on which the Software under this Agreement is designated to run solely for Customer's own internal data processing and computation needs as set forth hereinafter; provided, however that Customer may use a single backup computer system as a substitute for the Designated System only during such periods when the Designated System is inoperative because it is malfunctioning or undergoing repair, maintenance or modification. No right to use, copy, or display the Software in whole or in part is granted except as expressly provided in this Agreement.

Customer agrees to inform BIOSYM immediately of any changes in the location of the Software, and upon written request of BIOSYM, provide verification of the current location and computer system on which the Software is resident. Whenever a second computer system is permanently substituted for a first computer system, prior to the installation of the Software on the second computer system, an Addendum to the Agreement shall be executed which identifies the second computer system as the single Designated System. Upon BIOSYM's consent, the License and Software Maintenance fees paid for use with the first computer shall be applied to the second computer system.

Customer may use the Software solely to process the work of Customer's own business, including any unincorporated divisions and majority owned subsidiaries of Customer. Customer is expressly forbidden to use the Software to process the work of any non-majority owned affiliate or other third party.

Upon request at any time by Customer for the right to make or install additional copies of the Software on additional Designated Systems within Customer's organization, the parties shall execute an Addendum to the Agreement with appropriate Attachments to reflect a corresponding extension of the License.

Title to and ownership of the Software (and all copies and portions thereof) and all applicable rights to patents, copyrights, trademarks and trade secrets in the Software or any modifications, is permanently and irrevocably vested in BIOSYM and shall remain with BIOSYM notwithstanding the delivery of copies to and use of Software by Customer.

3. **Technology Protection** - Except as reasonably required to use the Software on the Designated System strictly in accordance with the License and except for one copy solely for back-up purposes, copying of the Software or any portion thereof, including Software that has been modified or incorporated into or with other software is expressly forbidden. Customer must reproduce and include the copyright notice and any other notices that appear on the original Software on any copies and any media therefor. Customer shall not (and shall not allow any third party to) (i) decompile, disassemble, or otherwise reverse engineer or attempt to reconstruct or discover any source code or underlying ideas or algorithms of the Software by any means whatsoever, (ii) remove any product identification, copyright or other notices, (iii) provide, lease, lend, use for timesharing or service bureau purposes or otherwise use or allow others to use the Software to or for the benefit of third parties, (iv) except as specified in the applicable user documentation provided by BIOSYM modify, incorporate into or with other software or create a derivative work of any part of the Software, (v) load or use any portion of the Software (whether or not modified or incorporated into or with other software) on or with any machine or system other than the applicable Designated System (or a substantially similar system during temporary inoperability of the applicable Designated System) or (vi) except if, as and to the extent expressly authorized in the applicable user documentation provided by BIOSYM, transmit or use the Software over a network.

Unless otherwise set forth in an appropriate Attachment, in no event may given Software be concurrently loaded on more CPU's than the number set forth in the Software Configuration/Pricing Attachment.

If the Software includes the BIOSYM computer program, *Sketcher* , Customer agrees that it will be used only for the purpose of building molecules in two dimensions (sketching) and subsequent generation of a three dimensional structure. Customer further agrees that *Sketcher* will not be used for the mass conversion of two dimensional structures obtained from molecular databases.

Customer agrees that the Software and/or Equipment and its associated documentation constitute and contain valuable trade secret and confidential business information of BIOSYM, or its third party suppliers, as applicable. Customer agrees to hold such information in confidence and to take all reasonable precautions necessary to safeguard the confidentiality of such information. Customer further agrees not to disclose, provide or otherwise make available such information in any form to any person other than Customer's or BIOSYM's employees. This provision shall survive any cancellation or termination of this Agreement.

4. **Software Maintenance** - Upon initial delivery of the Software, BIOSYM shall provide standard one year maintenance and support service, for the annual fee set forth in the Software Configuration/Pricing Attachment. BIOSYM Software Maintenance prices and maintenance prices for Software owned by parties other than BIOSYM which is provided hereunder, may be adjusted by BIOSYM at any time with 30 days prior written notice.

BIOSYM's obligation to provide maintenance and support services and Customer's obligation to pay the then prevailing maintenance and support charges shall be automatically renewed for successive one year periods unless either party gives to the other written notice of cancellation at least ninety (90) days prior to the expiration of the then expiring term.

Software Maintenance must be purchased to receive support services after the initial 30 day warranty period. Software Maintenance is prorated ahead to the first day of the month *following* receipt of Software to allow for shipping time and installation. (EXAMPLE: If Software is received on August 10, 1993 coverage would expire on September 30, 1994). As provided in the preceding paragraph, Customer will be automatically renewed for a successive one year period unless notice as previously described is given. At a minimum, Customer must purchase one full year of Software Maintenance.

BIOSYM shall provide Customer with maintenance and support services for the Software as follows:

> Distribution of Updates: Software Maintenance may consist of updates to the Software which (i) contain corrections of application software errors remedied by BIOSYM, (ii) changes to documentation, and (iii) minor enhancements which may extend the ways to accomplish inherent functions. Customer is responsible for the installation and implementation of any update and required data conversion. Major enhancements to the Software which add new functionality (as determined by BIOSYM at its sole discretion) may require payment of additional license fees and are not included in Software Maintenance services. Installation of any software received directly from the Equipment manufacturer or attachments, accessories, features, devices or additional equipment added by Customer shall be coordinated in advance with BIOSYM to ensure compatibility with the Software.
>
> Hotline: BIOSYM shall provide telephone consultation during normal San Diego business hours between 7:00 a.m. and 5:00 p.m., Monday through Friday except on January 1, President's Day, Memorial Day, July 4, Labor Day, Thanksgiving Day and the Friday following, and December 24 and 25. If one of the specified dates falls on a weekend, the holiday will be observed on the nearest weekday. Hotline Support will be limited to the then current version of the Software and its immediate predecessor version.

BIOSYM technical personnel shall be available at a charge described in Section 6, at BIOSYM's discretion, for on site service for problems not resolved by telephone consultation. Customer shall commit in advance to system availability during the scheduled on site visit.

Software Maintenance shall be available to Customer subject to the following conditions:

a. Customer is using the Software at the Site and on the Equipment and operating system for which it is licensed as detailed in the relevant Attachment by CPU serial number and CPU ID;

b. Customer is using the Equipment and operating system on which the Software is running in the form supplied by the manufacturer, without alteration; and

c. Customer is using the current version of the Software or its immediate predecessor version.

Any changes made to the Software by Customer or any other person or agency without the written permission of BIOSYM immediately releases BIOSYM from any responsibility to correct or maintain said Software, but in no way alters Customer's obligation to protect the Software under the terms of this Agreement.

Purchase of Software Maintenance service for a Customer Site shall be subject to purchase of such service for all BIOSYM supported Software modules licensed for use at that Site.

5. Equipment Maintenance - Subject to availability of such services, Equipment maintenance services beyond the applicable Equipment warranty periods set forth in Section 10 hereof may be purchased from BIOSYM under a separate maintenance contract with the Equipment manufacturer.

6. **Prices** - BIOSYM charges for the licensing of the Software and associated Software Maintenance and for the purchase of the Equipment are specified in the Attachments hereto, and Customer agrees to pay all such charges on the terms described in Section 7. The prices set forth in such Attachments are exclusive of and Customer agrees to pay: (a) freight on Equipment (b) transit insurance charges of one-half of one percent (.5%) of the list price of the Equipment with a minimum charge of ten dollars ($10); (c) shipping and handling for Software in the amount of twenty-five dollars ($25) per each software program licensed hereunder: (d) BIOSYM's time and material charges plus reasonable travel and living expenses for additional services requested by Customer in writing: and (e) all duties and taxes (exclusive of taxes based on BIOSYM net income). Customer agrees to support any claim of tax exemption by providing BIOSYM with a copy of the applicable tax exemption certificate prior to the delivery.

7. **Payment Terms** - BIOSYM's charges for the Software licensed and associated Software Maintenance and the Equipment purchased will be invoiced upon shipment; payment is due upon delivery of Software and/or Equipment. If the Customer agrees to receive a partial shipment of Software and/or Equipment, the Customer agrees to make payment for all items received in accordance with these terms. Charges for Software Maintenance will be invoiced annually, in advance; all other charges will be invoiced as incurred. Payment for first year Software Maintenance is due immediately upon delivery of the Software and payment for subsequent Software Maintenance is due at the beginning of the period covered. BIOSYM reserves the right to assess a late payment charge of one percent (1%) per month, or the maximum rate permitted by law, whichever is less, on the unpaid balance of any amount which is beyond thirty (30) days past due.

8. **Cancellation/Rescheduling Charges** - In the event Customer (i) cancels or changes all or any part of any order, exclusive of Software Maintenance, or fails to meet any obligation hereunder causing cancellation or delay in shipping of any order or portion thereof, or (ii) requests delay in shipping the order, and the request is accepted by BIOSYM, Customer agrees to pay upon BIOSYM's invoice the following charge:

Number of days between date notice is received by BIOSYM and anticipated shipment date	Charge as % of Customer's license/purchase price	
	Cancellation	Change
<15	65%	15%
15 - 30	10%	5%
31 - 60	5%	5%
>60	0%	0%

BIOSYM agrees to waive the foregoing change charges if Customer's change increases the net license/purchase price of its order more than ten percent (10%).

9. **Site Preparation/Delivery/Installation** - Customer shall, at its expense, prepare and maintain an installation Site. If BIOSYM provides Customer with written specifications as to Site preparation, Customer will prepare the installation Site in accordance with such specifications. BIOSYM will deliver, or cause to be delivered, the Software and/or Equipment in accordance with a mutually agreed upon schedule. The method of shipment will be determined by BIOSYM. Equipment, Software and other materials will be shipped FOB-BIOSYM or Equipment vendor, except that risk of loss shall pass to the Customer upon delivery to the Customer. Delivery of Equipment and/or Software is subject to its availability and the completion of Site preparation by the Customer. If ordered by Customer, BIOSYM will install or cause the Equipment to be installed. Installation services requested by Customer and agreed to by BIOSYM will be provided on a time and materials basis at BIOSYM's then current rates plus actual travel and living expenses.

10. **Limited Warranty and Disclaimer** - Subject to the conditions and limitations of this Agreement, BIOSYM warrants, for the sole benefit of Customer, that the Software shall materially conform to BIOSYM's published product specifications in effect on the date of this Agreement for a period of thirty (30) days from the date of shipment ("Software Warranty Period") and that during such period, BIOSYM, at its own expense shall exercise commercially reasonable efforts as described herein.

Upon receipt of written notice of an error in the Software which significantly degrades the Software as compared to its published product specifications, BIOSYM shall use its diligent efforts to provide a verbal and/or written response to Customer within thirty (30) days, or sooner, if possible, after such receipt. Such response may include the issuance of a correction to the Software and/or the associated Software documentation, issuance of a program operating restriction, or issuance of a program bypass, as appropriate under the circumstances. In order for this Software warranty to be applicable, Customer must promptly provide the following information to BIOSYM in writing for any alleged Software defects:

a. the operating conditions under which the defect occurs (including the specific hardware/Software configuration).

b. a description of what occurs as compared to what should occur, and
c. a representative example of inputs for repeating and analyzing the problem.

BIOSYM shall have no warranty obligations with respect to the Software, or any portion thereof, which has been (i) operated by Customer in a manner inconsistent with the requirements set forth in Software documentation or that has been modified by any party other than BIOSYM; (ii) damaged in any manner and by any cause other than the act or omission of BIOSYM; (iii) operated or maintained in environmental conditions outside the parameters designated by BIOSYM in the associated documentation or elsewhere; (iv) subjected to extreme power surge or electromagnetic field; or (v) operated on a computer system other than the Designated System or with Equipment modified or changed without authorization from BIOSYM.

BIOSYM does not warrant that the Software will necessarily meet Customer's planned applications, or that it will be error free, or that all Software defects can be corrected. Customer acknowledges and agrees that Software performance and response time are a function of Customer applications requirements and will be affected by the mix of concurrently running applications, any networking capability utilized by the Customer on his system and the amount of memory thereon. BIOSYM does not warrant that functions contained in the Software will operate in conjunction with equipment, software or services that may be obtained by Customer outside this Agreement. Customer also acknowledges that updated Software versions may not be compatible with outdated versions of equipment operating system software. BIOSYM does not warrant that the Software will operate in conjunction with outdated versions of equipment operating system software. This limited warranty covers only problems reported to BIOSYM during the Software Warranty Period.

BIOSYM agrees that warranties extended by original equipment manufacturers and suppliers are passed through to Customer if and to the extent permitted by those warranties. BIOSYM makes no warranties in association with such Equipment.

EXCEPT FOR THE FOREGOING EXPRESS LIMITED WARRANTY, BIOSYM DISCLAIMS ALL WARRANTIES RELATING TO EQUIPMENT AND SOFTWARE (INCLUDING DOCUMENTATION, TECHNICAL INFORMATION OR TECHNICAL ASSISTANCE PROVIDED UNDER OR PURSUANT TO THIS AGREEMENT), AND THE EQUIPMENT AND SOFTWARE IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND INCLUDING WITHOUT LIMITATION, ANY WARRANTY AGAINST INFRINGEMENT OF THIRD PARTY PROPERTY RIGHTS, FITNESS OR MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF BIOSYM HAS BEEN INFORMED OF SUCH PURPOSE). FURTHER, BIOSYM DOES NOT WARRANT, GUARANTEE, OR MAKE ANY REPRESENTATIONS REGARDING THE USE OR THE RESULTS OF THE USE, OF THE SOFTWARE OR DOCUMENTATION IN TERMS OF CORRECTNESS, ACCURACY, RELIABILITY OR OTHERWISE. Customer understands that BIOSYM is not responsible for and will have no liability for hardware, software, or other items or any services provided by any persons other than BIOSYM. BIOSYM shall have no liability for delays or failures beyond its reasonable control. NO AGENT OF BIOSYM IS AUTHORIZED TO ALTER OR EXCEED THE WARRANTY OBLIGATIONS OF BIOSYM AS SET FORTH HEREIN.

11. **Limitation of Remedies** - Customer acknowledges and agrees that the fees which BIOSYM is charging hereunder or in connection with Software Maintenance do not include any consideration for assumption by BIOSYM of the risk of Customer's consequential or incidental damages which may arise in connection with Customer's use of the Software and Equipment.

ANY LIABILITY OF BIOSYM, ITS OFFICERS, AGENTS OR EMPLOYEES WITH RESPECT TO THE EQUIPMENT OR SOFTWARE OR THE PERFORMANCE THEREOF UNDER ANY WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER THEORY WILL BE LIMITED EXCLUSIVELY TO PRODUCT REPLACEMENT OR, IF REPLACEMENT IS INADEQUATE AS A REMEDY OR IN BIOSYM'S OPINION IMPRACTICAL, TO A CREDIT OF AMOUNTS PAID TO BIOSYM FOR THE LICENSE/PURCHASE OF THE RELEVANT EQUIPMENT AND/OR SOFTWARE. BIOSYM SHALL NOT BE RESPONSIBLE OR LIABLE WITH RESPECT TO ANY SUBJECT MATTER OF THIS AGREEMENT OR ANY ATTACHMENT, PURCHASE ORDER, SCHEDULE OR TERMS AND

CONDITIONS RELATED THERETO UNDER ANY THEORY: (A) FOR LOSS OR INACCURACY OF DATA OR (EXCEPT FOR RETURN OF AMOUNTS PAID TO BIOSYM THEREFOR), COST OF PROCUREMENT OF SUBSTITUTE GOODS, SERVICES OR TECHNOLOGY; (B) FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO LOSS OF REVENUES AND LOSS OF PROFITS; OR (C) FOR ANY MATTER BEYOND BIOSYM'S REASONABLE CONTROL EVEN IF BIOSYM HAS BEEN ADVISED OF SUCH DAMAGES OR LOSSES. If BIOSYM is unable to correct a Software error that arises after the first year of Software Maintenance or furnish a work-around solution, Customer agrees that its sole remedy shall be the right to terminate Software Maintenance for the Software involved and the right to receive the refund described in the following sentence. BIOSYM will thereafter promptly refund a pro rata portion of that period's associated maintenance fee based on the remaining days of such period. Any credit granted by BIOSYM to Customer under this section is subject to Customer compliance with the terms of Section 3.

12. Indemnity - BIOSYM shall hold Customer harmless from liability resulting from infringement by the Software of any United States patent issued as of the date of delivery of the first copy of the applicable Software or any United States copyright, provided BIOSYM is promptly notified of any and all threats, claims and proceedings related thereto and given reasonable assistance and the opportunity to assume sole control over the defense and all negotiations for a settlement or compromise. BIOSYM will not be responsible for any settlement it does not approve in writing. THE FOREGOING IS IN LIEU OF ANY WARRANTIES OF NONINFRINGEMENT, WHICH ARE HEREBY DISCLAIMED.

BIOSYM's indemnity obligation does not apply with respect to Software or portions or components thereof (i) not supplied by BIOSYM, (ii) made in whole or in part in accordance to Customer's specifications, (iii) modified after shipment by Customer, if the alleged infringement relates to such modification, (iv) combined with other products, processes or materials where the alleged infringement relates to such combination, (v) where Customer continues allegedly infringing activity after being notified thereof or after being informed of modifications that would have avoided the alleged infringement, or (vi) where Customer's use of the Software exceeds the scope of the rights granted in this Agreement or is incident to an infringement not resulting primarily from the Software. Customer releases BIOSYM from any infringement claims arising under any of the circumstances described in the preceding sentence and agrees to indemnify BIOSYM from all damages, settlements, attorneys' fees and expenses related to a claim of infringement or misappropriation based upon the exclusions from indemnification contained in the preceding sentence.

BIOSYM, at its option, may obtain for Customer the right to continue using, or to replace or modify the Software involved so it becomes noninfringing, or, if such remedies are not reasonably available, grant Customer a credit for the Software involved, based upon its depreciated value, and accept its return.

13. Term and Termination - The License shall remain effective for a term of ten (10) years from the latest signature date on this Agreement unless terminated earlier in accordance with this Section 13, or unless a different term is specified in the Software Configuration Pricing Attachment. The License will terminate automatically if Customer fails to cure any material breach of this Agreement or any Attachment incorporated herein within thirty (30) days (10 days in the case of non-payment) of receiving notice of such breach from BIOSYM (or immediately upon notice in the case of a Customer's breach of Section 3. Upon termination, Customer shall immediately cease all use of the Software.

If termination is due to non-payment and Customer has acquired Equipment as part of this Agreement, Customer shall within fifteen (15) days after termination return all Equipment, FOB-BIOSYM, to BIOSYM.

Within fifteen (15) days after termination of the License, Customer shall destroy the original and all copies of the Software in all forms, and shall certify to BIOSYM in writing that such obligation has been fulfilled.

Except for the License and except as otherwise expressly provided herein, the terms of this Agreement shall survive termination. Termination is not an exclusive remedy and all other remedies will be available whether or not the License is terminated.

14. Government Matters - Customer will not remove or export from the United States or reexport from anywhere any part of the Software or any direct product thereof to Haiti, Iran, Iraq, Syria, Yugoslavia (Serbia and Montenegro), the Peoples' Republic of China or any Group Q, S, W, Y, or Z country (as specified in Supplement No. 1 to Section 770 of the U.S. Export Administration Regulations, or a successor thereto) or otherwise except in compliance with and with all licenses and approvals required under applicable export laws and regulations, including without limitation, those of the U.S. Department of Commerce.

Unless BIOSYM's Government License Attachment is attached, Customer represents that it is not a government agency and it is not acquiring the License pursuant to a government contract or with government funds.

15. Notices - All notices required by or relating to this Agreement shall be in writing and shall be deemed to be given if delivered personally, by facsimile or mailed by first class mail (postage prepaid) to the parties to this Agreement at the address or facsimile number specified below, or to such other address or facsimile number as either party may substitute by written notice to the other:

Customer: (Same has been set forth on the signature page of this Agreement)

BIOSYM: BIOSYM Technologies, Inc.
ATTN: Sales Administration
9685 Scranton Road
San Diego, CA 92121
Facsimile Number: (619) 597-4975

16. General - This Agreement shall be binding upon and inure to the benefit of the successors, and assigns of the parties hereto provided, however, that Customer may not assign, pledge or otherwise transfer this Agreement or the License, in whole or in part, without the written consent of BIOSYM, which consent shall not be unreasonably withheld by BIOSYM for an assignment of all of the rights and obligations of the Agreement.

The failure of either party to enforce at any time any of the provisions of this Agreement shall in no way be construed to be a waiver of such provision, nor in any way affect the validity of this Agreement or any part thereof, or the right of the other party thereafter to enforce each and every provision.

BIOSYM shall not be liable for any delay in or failure of performance due to any cause or condition beyond BIOSYM's reasonable control, whether foreseeable or not.

If any provisions of this Agreement are invalid under any applicable statute or rule of law, they are, to that extent, omitted, but the remainder of this Agreement shall continue to be binding upon the parties hereto.

Nothing contained in this Agreement shall be deemed or construed as creating a joint venture or partnership between the parties. No party by virtue of this Agreement is authorized as an agent, employee or legal representative of the other party, and the relationship of the parties is, and at all times will continue to be, that of independent contractors.

If Customer or any of its employees breaches or threatens to breach the obligations of this Agreement, BIOSYM shall have the right, in addition to such other remedies which may be available with it, to injunctive relief enjoining such acts or attempts, it being acknowledged that legal remedies are inadequate.

This Agreement may be executed in counterparts, which together shall construe one and the same instrument.

Agreement No.: C13226

The Section headings are for convenience only and do not form part of this Agreement for purpose of interpretation.

The Agreement shall be governed and construed in accordance with the laws of the State of California and the United States without giving effect to the principles of the conflicts of laws.

Any legal proceedings arising under this Agreement shall be instituted only in the courts of the State of California.

In any suit or proceeding brought to enforce or interpret this Agreement, the prevailing party shall be entitled to recover from the other party reasonable attorneys' fees and costs in addition to any other relief to which such party may be otherwise entitled.

Any waivers or amendments shall be effective only if made in writing by non-preprinted agreements clearly understood by both parties to be an amendment or waiver and signed by a representative of the respective parties authorized to bind the parties.

This Agreement shall be effective on the date of execution by the last signator.

17. **Entire Agreement** - The following Attachments are an integral part of and incorporated by this reference into this Agreement. (Check all applicable Attachments.)

- ☐ Software Configuration/Pricing Attachment
- XX Equipment Configuration/Pricing Attachment
- ☐ International Attachment
- ☐ Government License Attachment
- ☐ Open Interface Attachment
- ☐ Access Attachment
- ☐ License/Purchase Agreement Change Attachment
- ☐ Other ______________________________

This Agreement and the Attachments hereto constitute the entire agreement between the parties and shall supersede all proposals or prior agreements, oral or written and all other communications between the parties relating to the subject matter of this Agreement. The price terms of this Agreement are confidential and no press release or other written or oral disclosure of any nature regarding the price terms of this Agreement shall be made by either party without the other party's prior written approval; however, approval for such disclosure shall be deemed given to the extent such disclosure is required to comply with governmental rules.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized officers/employees.

	Accepted:
Customer: AUM Corporation	BIOSYM Technologies, Inc.
Signature ______________	Signature ______________
Name YASUO HIRAMATSU	Name Todd Schmidt
Title Sales Manager	Title Vice President of Finance
Date 3-13-95	Date ______________
Address 8 East 48 Street #2E	Agreement No. ______________
City, State, Zip New York NY 10017	
Telephone Number 212-421-3687	
Facsimile Number 212-421-3687	Email Number ______________

THIS AGREEMENT WILL BECOME BINDING UPON BIOSYM ONLY WHEN ACCEPTED IN WRITING BY BIOSYM'S AUTHORIZED REPRESENTATIVE.

AGREEMENT NO. C13226

BIOSYM TECHNOLOGIES, INC.
EQUIPMENT CONFIGURATION / PRICING ATTACHMENT

This Attachment related to and is incorporated into the above referenced Agreement. Capitalized terms in this Attachment have the same meaning as in the Agreement. This Attachment is an additional part of the Agreement and does not change or supersede any term of the Agreement except to the extent unambiguously contrary thereto.

Customer Name: AUM CORPORATION
User Name: Dr. Y. Hiramatsu

Equipment purchased by the Customer shall consist of the following:

QTY	DESCRIPTION		SALE PRICE
1	Power Indigo2 R8000, Extreme Graphics, 64MB, 2GB		
		Total Hardware	$43,035
		Warranty	$3,965
		GRAND TOTAL	$47,000

As described in Customer Purchase Order Number: MHP950227

SPECIAL SHIPPING INSTRUCTIONS:

User / Contact Name: Dr. Y. Hiramatsu

Phone Number: (212) 421-3687

Fax Number: (212) 421-3687

E-Mail Address:

Shipping Address (if different from Mailing):

City State Country Zip

Computer Registration Form

Salesperson - John Bonscher

Commercial

Company #

Custard Site #

Custard User #

COMPANY INFORMATION

User Name Dr. Y. Hiramatsu
CompanyName AUM Corporation
Address 1 8 East 48th Street
Address 2 2nd Floor - 2E
Address 3
City New York
State NY **Zip** 10017
NonUSA
Phone Number (212) 421-3687 **Fax Number** (212) 421-3687
EMail Address

Shipping Instructions
See Below

DATABASE CROSS REFERENCES

NDA Trial# **Quote #** NJ95-5199A **Order #** 13226

Media 1st Choice CD **Media 2nd Choice**

(Workstation: CD, 8mm, 4mm DAT, 150 MB Cartridge)

If license transfer, fill in existing computer data:

Transfer Mfg **Transfer Model**
Transfer Hostname **Transfer Serial #**

COMPUTER DATA FOR WHICH NEW/UPDATED LICENSE IS NEEDED

Computer Mfg SGI **Computer Model** Power Indigo2
Hostname iris **Serial #**
lmhostid*

The lmhostid Input value is obtained by executing a unix command on the computer for which this value is desired. The command depends on the make of the computer.

for SGI, the command is /etc/sysinfo -s

for IBM, the command is /bin/uname -m

for Sun, the command is /bin/hostid

for other makes of computers, this field is not required.

13226

ORDER APPROVAL FORM (Hardware Only) Pg 1 of 2

Date: 2/28/95
Attention: Susan Hernan Fax: (619) 597-4975

Order No.	
Costand Co. No.	
Quote No.	NJ95-5199A
Sales Manager	John Bonacher

User Address: Site No.
AUM CORPORATION
Dr. Y. Hiramatsu
6 East 48th Street
2nd Floor - 2B
New York, NY 10017

Telephone: (212) 421-3087 Fax: (212) 421-3687
E-Mail:

Shipping Address: Site No.
Biosym Technologies, Inc.
Mr. John Bonacher/Mr. Brian Kell
4 Century Drive
Second Floor
Parsippany, NJ 07054

New LPA & HW page Needed

P.O. Number: MHI*950227

Telephone: (201) 267-4476 Fax: (201) 267-9648
E-Mail: jdb@biosym.com/bak@biosym.com

Agreement No. 13226
Addendum No.

PRICING SUMMARY	Currency US$
Total Hardware Price	$43,035
Extended Warranty Price	$3,965
(-) Total Hardware Cost	$40,603
TOTAL MARGIN	$6,397

Pricing Justification / Comments:

Is this a modification to an existing order ? Yes (chg to order)

Payment Terms: Net 30 Days

Exceptions to the above terms: NONE

Sales Tax ? No (If Exempt provide Exemption Certificate - US only)

STATUS	NEW
Business Unit	Life Science
TYPE	Commercial
Entity	Inc.

For use by Sales Administration

Purchase Order received: [✓ Yes] / No
Copy of LPA Attached to Order Approval: Yes / No
Signed LPA Received from Customer: Yes / No
Comments: Will they purchase Software - ??

Order Acknowledged & Approved by:
Director, Administrative Operations 2/28/95 (Date)

CUSTOMER STATUS CHECKLIST

Cust# ______
Site# ______
User# ______

Quarter 1 Year 95

Order# 13226
Quote # 5199A
Agreement# A13226
Addendum# New

Company Name: AUM Corporation
Contact (User): Dr Y. Hiramatsu

New Orders

Sent to San Diego:

Order Approval Form:

For Approval: 2/28/95 Received back: 2/28/95

License Purchase Agreement:

For approval 2/28 2 originals in weekly package: 3/17

Quote:

HW 2/28
SW ______
HW/SW ______

Purchase Order:

Purchase Order #: MHP950227
Purchase Order Amount: $ 47,000

CRF/Shipping Authorization Form w/ orig signed LPA: 3/14

Sent to Customer:

Comp Reg Form: Sent @b N/A yet Rec'd ______

License Purchase Agreement: Mailed 3/1 Via: DHL Rec'd 3/14

NOTES: Left note for him to bring the signed addens w/ him when he comes in — HW is being shipped here ✓

SGI Power Indigo2 CD hostname - IRIS

BIOSYM
Technologies, Inc.
9685 Scranton Rd.
San Diego, CA 92121

April 25, 1995

Dr. Yasau Hiramatsu
AUM Corporation
8 East 48th St. #2E
New York, NY 10017

Dear Dr. Hiramatsu,

According to your Purchase Order # MHP950227 for a Silicon Graphics workstation ("Equipment"), you agreed to pay us within 30 days of receipt of our invoice. On April 17, I transmitted a letter to you by facsimile indicating that payment was due April 13, and that we had yet to receive it. On April 19, we spoke about this situation and you indicated that due to the current situation in Japan and the location of the Equipment at a third party's ("I.C.P.") place of business you were unsure of when we could expect to be paid or if you would be able recover the Equipment.

As part of this sales transaction, you executed a License Purchase Agreement ("Agreement") setting forth the terms and conditions governing the sale of this Equipment. According to Paragraph 13 of this Agreement (which follows), you are in breach of the Agreement due to non payment.

"13. Term and Termination - The License shall remain effective for a term of ten (10) years from the latest signature date on this Agreement unless terminated earlier in accordance with this Section 13, or unless a different term is specified in the Software Configuration Pricing Attachment. The License will terminate automatically if Customer fails to cure any material breach of this Agreement or any Attachment incorporated herein within thirty (30) days (10 days in the case of non-payment) of receiving notice of such breach from BIOSYM (or immediately upon notice in the case of a Customer's breach of Section 3. Upon termination, Customer shall immediately cease all use of the Software.

If termination is due to non-payment and Customer has acquired Equipment as part of this Agreement, Customer shall within fifteen (15) days after termination return all Equipment, FOB-BIOSYM, to BIOSYM."

Therefore, in accordance with the terms of this Agreement, we ask that you return the Equipment within 15 days of receipt of this notice.

Corporate Office 9685 Scranton Road San Diego CA 92121 619 458-9990 FAX 619 458-0136

If, as you indicated to me in our phone conversation, you are unable to recover possession of the Equipment from I.C.P., we request that you notify them that they should release the Equipment to us as soon as possible.

Thank you in advance for your prompt attention to this matter.

Sincerely,

Kelly B. Cole
Director, Administrative Operations

cc: Mr. Cameron Haider
I.C.P. Corp.

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 20

Tripos

November 3, 1995

Mr. Scott Newton
Senate Permanent Sub-Committee on Investigation
Room 193 - Russell Building
Washington, DC 20510

Dear Mr. Newton:

John McAlister, President and CEO of Tripos, Inc. asked that I send you a hard copy of what was faxed to you last week regarding AUM.

Sincerely,

Dottie Gruber

Dottie Gruber
Executive Assistant

Tripos, Inc.
1699 South Hanley Road ▲ St. Louis, MO 63144
Phone 314 647-1099 ▲ Fax 314 647-9241
Munich Germany ▲ Palaiseau, France ▲ Bracknell, UK ▲ Korea ▲ Japan ▲ Taiwan

Monday, March 27, 1995

Ward Davidson
Tripos [illegible]
1699 S Hanley Rd
St. Louis, Mo 63144

Dear Ward:

Here is a description on Tripos' interaction with AUM Co. to Date:

March 3,1995 - Mr. Hiramatsu contacts the Tripos New Jersey Office and is referred to me . I call him at his hotel in California, where he urgently requests information about our software. He says he has seen our software through a company he worked with in Japan. He has projects that he needs to start by the end of March. He will not divulge what his company does. He wants to begin an evaluation before March 10, 1995. We initially fax info to his hotel in San Jose. He calls and wants all our marketing sheets on all products. He wants to decide what to evaluate. We fed-ex the brochures. Betsy and I agree to go to his office to set-up an evalution the next Friday (March 10th). I am unavailable, Betsy and Anna will go. I have a budgeting quote faxed to him at his hotel as per his request.

March 7,1995 - Hiramatsu leaves me voicemail. I call him and he says SGI is delaying delivery of his machine until Monday. We reschedule installation meeting for Tuesday (March 14th). He still will not give any significant details about his company says " save for meeting". I inform him that I cannot meet with him until Wednesday. Betsy and I will go in the day following the installation.

March 9,1995 - I respond to Hiramatsu's voicemail from Atlanta. More meeting confirmation Talk about the purchase process. Confirm Wednesday meeting time (March 15th).

March 13,1995 I receive a fax from Hiramatsu (enclosed) stating that the SGI workstation is delayed. By the end of the day he promises that he will have the machine by Tuesday (14th) afternoon. We schedule Anna to go there in the late afternoon.

March 14, 1995- Anna Toy Palmer, accompanied by Mary Rogowski, installs ALL of our modules on Hiramatsu's workstation (We had thought he picked out specific modules). He wants everything. When Betsy and I find out about this, we are very suspicious.

March 15, 1995 - After speaking with Mary via carphone, Betsy and I are concerned about AUM's motives. When we visit the account, Hiramatsu stands us up. There is only his assistant. She gives us 2 letters from Hiramatsu (enclosed). As you can see in the letter He discussed Legion and Selector with Anna, and wants to evaluate that,too.

March 16, 1995 - Hiramatsu demands to ahve an application scientist come back and complete the installation with MM3 and Legion/Selector. I explain that we need to meet with him first He argues for quite some time. We set up a meeting at the Red Bank office (We don't like his place.) for March 29th.

March 17, 1995 - Hiramatsu calls and tries to convince me that he needs Legion and Selector installed " just send it to me and I will install". No Dice. He claims he cannot start his problem set evaluation until all the software is present.

March 20, 1995 - I talk with Martin Stuart about AUM. He finds out from Japanese distributor that Hiramatsu inquired about Tripos' software there,also. He did not leave any detailed information about himself with that office.

March 21, 1995 - Hiramatsu calls and says that having used our software in Japan, he knows that we have menubars in Japanese. He wants a hrdcopy of those. I tell him that I'll Check on it.

That is the final contact that I had with Hiramatsu. I left messages for him to confirm our Wednesday meeting. He left me a message today cancelling our meeting, but said he wanted to talk to me later about the purchase process.

Let me know if you have questions.

Sincerely,

Jeff Martin

Jeff Martin

AUM COR., USA

8 EAST 48TH ST., #2E (2ND FLOOR)
NEW YORK, N.Y. 10017 USA
TEL&FAX 212-421-3687

TO : TRIPOS ASSOCIATES INC.
621 SHREWSBURY AVE. SHREWSBURY, NJ 07702
ATTN : MR.JEFF MARTIN
C.C. : MS.BETSY DELL'AGLIO
TEL : 312-342-5578
FAX : 312-342-6184
FM : Y.HIRAMATSU

URGENT!!

DATE 13TH/MAR/1995

RE : VISITING MY OFFICE

HELLO. TKS FOR YOUR KIND ARRANGEMENT.
HERE I HAVE TO EXPLAIN ONE BIG PROBLEM.

WE HAVE ARRANGED ONE NEW SGI COMPUTER FOR THIS PROJECT.
WE HAVE ORDERD ON 27TH/FEB TO SGI COMPANY.
THEY PROMISED THAT DELIVERY DATE WAS LAST FRIDAY.
BUT STILL WE DIDNT RECEIVE OUR MACHINE. IT IS DELAY!
I TRIED TO PUSH SGI, BUT NO GOOD RESPONSE STILL NOW.
WE ARE SO READY, BUT MACHINE IS NOT READY.

I AM SO SORRY FOR THIS UN-CONVENIENCE, BUT PLS KINDLY UNDERSTAND OUR SITUTAION.

THEN TODAY I WILL TRY TO PUSH SGI COMPUTER, AND MAKE SURE EXACT READY DATE AT OUR OFFICE.
IF I CAN RECIEVE TODAY, NO CHANGE OF OUR MEETING SCHEDLUE.
BUT IF NOT TODAY, COULD WE POSTPONE THE SCHEDULE?
PLS KINDLY ADVISE YOUR CONVENIENT DATE & TIME AFTER THIS TUE.

ANYHOW I WILL SURELY CALL YOU ON THIS ISSUE BEFORE NOON.

ONCE AGAIN, SO SORRY FOR OUR UNCONVENIENCE.

WE ARE LOOKING FORWARD TO SEEING YOU VERY SOON.

TKS AND BEST REGARDS,

Y.HIRAMATSU / AUM COR.

AUM COR., USA

8 EAST 48TH ST., #2E (2ND FLOOR)
NEW YORK, N.Y. 10017 USA
TEL&FAX 212-421-3687

TO : TRIPOS ASSOCIATES INC.
621 SHREWSBURY AVE. SHREWSBURY, NJ 07702
ATTN : MR.JEFF MARTIN
C.C. MS.BETSY DELL'AGLIO
TEL : 312-342-5578
FAX : 312-342-6184
FM : Y.HIRAMATSU
DATE 15TH/MAR/1995

RE : WELCOME TO OUR AUM CORP.

HELLO.
TKS A LOT FOR YESTERDAY INSTALLATION. I WAS SO GLAD TO SEE THEM.
I AM PERSONALY REALLY APPRECIATED YOUR GOOD SUPPORTING.

TODAY DEU TO VERY IMPORTANT MEETING WITH A COMPANY IN SANJOSE,
WE HAVE TO FLY THERE AGAIN.
AS YOU KNOW WELL, I FLY ALMOST EVERY WEEK TO THERE.
BECAUSE THIS IS OUR BIGGEST PROJECT NOW.
SO SOMETIMES I CANT CONTROL URGENT CHANGE OF SCHEDULE LIKE TODAY.
I FEEL SO SORRY FOR THIS BIG UNCONVENIENCE FOR YOU.
I DEEPLY APOLOGIZE MY REDENESS.

THEN TO MAKE MORE STEP, HERE I WOULD LIKE TO CONFIRM FOLLOWING ISSUE,
IF YOU LEAVE ANY ADVISE & MESSAGE ABOUT THIS, I AM VERY HAPPY.

1. ORIGINAL QUOTATION
WE NEED YOUR ORIGINAL QUOTATION FOR OUR TARGET SOFTWARE.
LAST WEEK I SENT MY TOTAL TARGET SOFTWARE. AND ALL OF THEM WAS INSTALLED NOW.
SO PLS GIVE US ANY QUOTATION.

2. 30DAYS LICENSE AGREEMENT
TKS FOR YOUR KIND INSTALLATION. THEN I SUPPOSE WE SHALL DO SOME UN-DISCLOSE AGREEMENT. SO PLS LEAVE IT HERE. I WILL SIGN BACK TO YOU.

3. MENU
YESTERDAY YOUR STAFF SAID THAT SOME OF MENU IS MISSING.
SO PLS KINDLY ARRANGE IT. WE MISS ABOUT 11 BOOKS.

4. SOFTWARE INSTALLATION PROBLEM
WE FOUND FOLLOWING 3 SOFTWARE HAS SOME PROBLEM.
1) MM3
2) MATCHMAKER
3) ??
PLS CHECK IT AGAIN. AND MAKE COMPLETE.
TKS IN ADVANCE.

5. NEW SOFTWARE
YESTERDAY I GOT CATALOG OF "THE MOLECULAR DIVERSITY MANAGER"
IT IS REALLY UNIQUE AND EXCELLENT.
IF POSSIBLE, PLS ADD THE KEY LICENSE OF THIS SYSTEM ALSO.
SOFTWARE WILL BE "LEGION" AND "SELECTOR".
^^^^^^^^^ ^^^^^^^^^^

BECAUSE THIS IS JUST ONE OF WHAT WE ARE GOING TO DO FROM NOW.

6. NEXT CONVENIENT DATE FOR SALE MEETING

SO SORRY AGAIN FOR TODAY. BUT IF YOU DONT MIND, I WANT TO VISIT
YOUR OFFICE TO HAVE A BUSINESS MEETING WITH YOU.
I CAN GO TO NJ BY CAR OR TRAIN.
IF YOU CAN MAKE ANOTHER DATE FOR US, I WILL REPLY FOR IT.

FINALY TODAY AT MY OFFICE, WE HAVE ONLY ONE NEW STAFF.
SHE CAN SPEAK ENGILSH, BUT SHE ISNT FAMILIAR WIHT THIS KIND OF SOFTWARE
TECHNICAL ISSUE. BUT SHE CAN HELP YOU ANYHOW YOU NEED.

I AM LOOKING FORWARD TO SEEING YOU ON NEXT TIME

TKS AND BEST REGARDS,

Y.HIRAMATSU / AUM COR.

AUM COR., USA

8 EAST 48TH ST., #2E (2ND FLOOR)
NEW YORK, N.Y. 10017 USA
TEL&FAX 212-421-3687

TO : TRIPOS ASSOCIATES INC.
621 SHREWSBURY AVE. SHREWSBURY, NJ 07702
ATTN : MR.JEFF MARTIN
C.C. MS.BETSY DELL'AGLIO
TEL : 312-342-5578
FAX : 312-342-6184
FM : Y.HIRAMATSU

DATE 8TH/MAR/1995

RE : VISITING MY OFFICE

HELLO. TKS FOR YOUR KIND ARRANGEMENT.
HERE I WANT TO CONFIRM YOUR SOFTWARE ENGINEER VISITING SCHEDULE

DATE : 14TH / MAR / '95
TIME : 13:00 PM
PLACE : AT MY NY OFFICE.
OUT OFFICE IS 4TH FLOOR ROOM #4F
REMARKS :

<HARDWARE>
POWER INDIGO2 R8000, EXTREME GRAPHICS, 64MB, 2GB
20" MONITOR, EXTERNAL 4x CD-ROM, EXTERNAL 4.3GB HDD
(*) WE DONT HAVE TAPE DRIVE.

<SOFTWARE>
UNITY
CONCORD
TRIAD NMR
DIANA
MARDIGRAS+
CAPRI
SYBYL/BASE
LEAPFROG
DISCO
MM2(91)
MM3(92)
BOSS
MOLCAD
SYBYL/ADVANCED COMPUTATION
RECEPTOR
SYBYL/BIOPOLYMER
COMPOSER
MATCHMAKER
PROTEP
SYBYL/QSAR WITH COMFA
SYBYL/DYNAMICS

SOFTWARE EVALUATION PERIOD IS 30 DAYS.
AFTER 30 DAYS, WE WILL INFORM YOU OF CONFIRMATION OF PURCHASING.
THEN PLS ISSUE ORIGNAL LICENSE.

SO PLS KINDLY DO ALL INSTALLATION AND PROVIDE MENU OF SOFTWARE.

WE ARE LOOKING FORWARD TO SEEING YOU ON NEXT TUE.

TKS AND BEST REGARDS,

QUOTATION

Tripos, Inc.
1699 S. Hanley Road, Suite 303
St. Louis, MO 63144
(314) 647-1099 Fax (314) 647-9241

Quotation No:	6824
Quotation Date:	3/16/95
Page	1 of 1
Sales Rep:	Martin
Quote By:	Maloney
Expires:	4/15/95

TO: AUM USA Company, Ltd.
8 East 48th Street, #4F
New York NY 10017

ATTN: Yasuo Hiramatsu TEL: 212-421-3687 FAX: 212-421-3687

WE ARE PLEASED TO SUBMIT THIS QUOTATION IN RESPONSE TO YOUR INQUIRY

ITEM	[illegible]	[illegible] NO	DESCRIPTION	UNIT PRICE	EXTENDED AMOUNT
1	1		Sybyl Basic, Single Simultaneous User	$30,000	$30,000
2	1		Advanced Computation, Single Simultaneous User	$25,000	$25,000
3	1		BioPolymer, Single Simultaneous User	$25,000	$25,000
4	1		Composer, Single Simultaneous User	$18,000	$18,000
5	1		Qsar/CoMFA, Single Simultaneous User	$30,000	$30,000
6	1		Dynamics, Single Simultaneous User (w/purchase of Sybyl Basic and 1 additional advanced module)	$0	$0
7	1		Leapfrog, Single Simultaneous User	$30,000	$30,000
8	1		Disco, Single Simultaneous User	$25,000	$25,000
9	1		Molcad, Single Simultaneous User	$8,500	$8,500
10	1		Triad NMR, Single Simultaneous User	$36,000	$36,000
11	1		Capri, Single Simultaneous User	$20,000	$20,000
12	1		Diana, Single Simultaneous User	$7,500	$7,500
13	1		Mardigras, Single Simultaneous User	$5,000	$5,000
14	1		Unity 2D, Single Simultaneous User Includes 1 Relational Database Interface and 1 Search Engine	$25,000	$25,000
15	1		Unity 3D, Single Simultaneous User Includes 1 Search Engine	$20,000	$20,000
16	1		Concord Standalone, Single Simultaneous User	$25,000	$25,000
17	1		MatchMaker, Single Simultaneous User	$17,500	$17,500
18	1		MM2(91), Single Simultaneous User	$15,000	$15,000
19	1		MM3(92), Single Simultaneous User	$15,000	$15,000
20	1		Receptor, Single Simultaneous User	$15,000	$15,000
			Software purchase includes a 90 day warranty. Annual Software Support and Update Service is then 18% of list price.		

Special Instructions:		Unless specifically noted above, prices quoted do not include sales or similar taxes, freight, insurance special handling or packaging.		TOTAL $392,500
TERMS Balance Net 30	F.O.B. Origin	FREIGHT Prepay and Add	EST. DELIVERY	

This quotation shall remain in effect for 30 days from the quotation date, unless modified in writing by Tripos, Inc. and is subject to the terms and conditions of Tripos' standard Agreement for Licensed Software or other applicable standard agreements. This quotation becomes a Purchase Order when signed by an authorized customer representative and accepted at Tripos corporate office by a duly authorized representative of Tripos.

QUOTATION

Tripos, Inc.
1699 S. Hanley Road, Suite 303
St. Louis, MO 63144
(314) 647-1099 Fax (314) 647-9241

Quotation No:	6825
Quotation Date:	3/16/95
Page	1 of 1
Sales Rep:	Martin
Quote By:	Maloney
Expires:	4/15/95

TO: AUM USA Company, Ltd.
8 East 48th Street, #4F
New York NY 10017

ATTN: Yasuo Hiramatsu TEL: 212-421-3687 FAX: 212-421-3687

WE ARE PLEASED TO SUBMIT THIS QUOTATION IN RESPONSE TO YOUR INQUIRY

ITEM	QTY	PART NO.	DESCRIPTION	UNIT PRICE	EXTENDED AMOUNT
1	1		Legion, Single Simultaneous User	$30,000	$30,000
2	1		Selector, Single Simultaneous User	$85,000	$85,000
			Software purchase includes a 90 day warranty. Annual Software Support and Update Service is then 18% of list price.		

Special Instructions:		Unless specifically noted above, prices quoted do not include sales or similar taxes, freight, insurance special handling or packaging		TOTAL $115,000
TERMS Balance Net 30	F.O.B. Origin	FREIGHT Prepay and Add	EST. DELIVERY	

This quotation shall remain in effect for 30 days from the quotation date, unless modified in writing by Tripos, Inc. and is subject to the terms and conditions of Tripos' standard Agreement for Licensed Software or other applicable standard agreements. This quotation becomes a Purchase Order when signed by an authorized customer representative and accepted at Tripos corporate office by a duly authorized representative of Tripos.

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

(516) 234-8000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

Senate Permanent Subcommittee
on Investigations

EXHIBIT # 21

October 13, 1995

Chairman, Senate Permanent Subcommittee
on Investigations of the Committee on
Governmental Affairs
Senate Office Building
193 Russell
Washington D. C. 20510

Re: Subpoena #E02272

Gentlemen:

Enclosed please find documents requested in the above referenced subpoena.

As you will note, we do not save telephone messages, and our files are not stored on computer disks. However, we have enclosed all documentation contained in our files.

You will also note that the file for Devinir Millionaire which you have requested, is in our records as ICP.

We have also enclosed a copy of the subpoena, for your reference.

If we can be of further assistance, please contact me.

Sincerely,

MORRIS ROTHENBERG & SON, INC.

Howard Somberg
Vice President

HS/vl
enc.

UNITED STATES OF AMERICA

E02272

Congress of the United States

To ROTHCO
Smithtown, New York

, Greeting:

Pursuant *to lawful authority, YOU ARE HEREBY COMMANDED to appear before the SENATE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS OF THE COMMITTEE ON GOVERNMENTAL AFFAIRS of the Senate of the United States, on* October 20th, *19*95,

at 10:00 *o'clock* a. *m., at their committee room* 193 Russell Senate Office Building, Washington, D.C. 20510, *then and there*

to testify what you may know relative to the subject matters under consideration by said committee., and produce any and all records, receipts, rough notes, files, computer records, computer disks, telephone messages, sales receipts, bills of lading, shipping instructions, shipper's export declarations, U. S. Department of State Defense Trade Controls Export licenses, relating to and in connection with the following businesses:

Aum Ltd.
Aum USA
Aum Publisher
Aum

Maha Posya ✓
Maha Posa
Devenir Millionaire ✓

Hereof fail not, *as you will answer your default under the pains and penalties in such cases made and provided.*

To

to serve and return.

Personal appearance in Washington, D.C. waived if subpoenaed materials are produced on or before the herein appointed date and time.

Given *under my hand, by order of the committee, this* 11th *day of* October, *in the year of our Lord one thousand nine hundred and* ninety-five.

Chairman, Senate Permanent Subcommittee on Investigations of the Committee on Governmental Affairs.

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

[illegible]
(516) 234-6000
National Toll Free
(800) 645-5195
Fax: (516) 234-877

FAX TO: MAHA POSYA, INC.

DATE: FEB. 9, 1995 PAGE 1 OF 2

ENCLOSED PLEASE FIND REVISED PROFORMA INVOICE WITH NEW NAME.

PLEASE REMIT $1,906.65 TO OUR ACCOUNT AS NOTED IN FAX OF FEBRUARY 8.

RGDS,
HOWARD SOMBERG

2-9-95

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

Telephone
(516) 234-8000
National Toll Free
(800) 645-5195
FAX: (516) 234-8772

February 13, 1995

Everswift
~~UPS YAMATO~~

Gentlemen:

Enclosed please find invoice/packing list covering merchandise to be shipped by air to Maha Posya Inc. in Tokyo, Japan.

Please insure for CIF value. All charges are for account of consignee.

Thank you.

Sincerely,

MORRIS ROTHENBERG & SON, INC.

Ginger LaLumia
export manager

enc.

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

Telephone
(516) 234-8000
National Toll Free
(800) 645-5195
FAX: (516) 234-8772

February 13, 1995

MAHA POSYA INC.
1-7-4 MINAMI-AOYAMA
MINATOKU
TOKYO JAPAN 107

Gentlemen:

Thank you for your recent order. We are pleased to enclose the invoice/packing list covering merchandise shipped.

Freight has been turned over to Everswift.

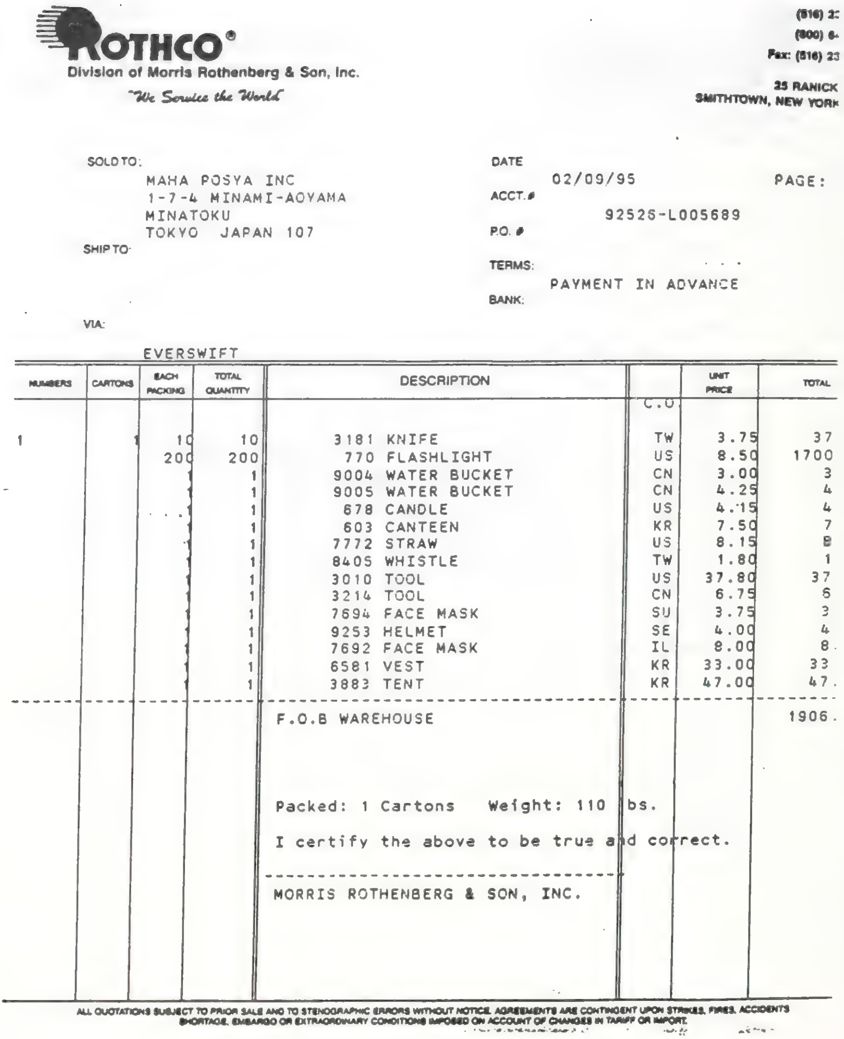
We trust your merchandise arrives promptly and in good order, and we look forward to the pleasure of hearing from you again.

Sincerely,

MORRIS ROTHENBERG & SON, INC.

Howard Somberg
Vice President

HS/jc
enclosure



ROTHCO®
Division of Morris Rothenberg & Son, Inc.
"We Service the World"

(516) 2
(800) 6
Fax: (516) 23

25 RANICK
SMITHTOWN, NEW YORK

SOLD TO:
MAHA POSYA INC
1-7-4 MINAMI-AOYAMA
MINATOKU
TOKYO JAPAN 107

SHIP TO:

VIA:
EVERSWIFT

DATE: 02/09/95
PAGE:
ACCT.#: 92526-L005689
P.O. #:
TERMS: PAYMENT IN ADVANCE
BANK:

NUMBERS	CARTONS	EACH PACKING	TOTAL QUANTITY	DESCRIPTION	C.O	UNIT PRICE	TOTAL
1	1	10	10	3181 KNIFE	TW	3.75	37
		200	200	770 FLASHLIGHT	US	8.50	1700
		1	1	9004 WATER BUCKET	CN	3.00	3
		1	1	9005 WATER BUCKET	CN	4.25	4
		1	1	678 CANDLE	US	4.15	4
		1	1	603 CANTEEN	KR	7.50	7
		1	1	7772 STRAW	US	8.15	8
		1	1	8405 WHISTLE	TW	1.80	1
		1	1	3010 TOOL	US	37.80	37
		1	1	3214 TOOL	CN	6.75	6
		1	1	7694 FACE MASK	SU	3.75	3
		1	1	9253 HELMET	SE	4.00	4
		1	1	7692 FACE MASK	IL	8.00	8.
		1	1	6581 VEST	KR	33.00	33
		1	1	3883 TENT	KR	47.00	47.
				F.O.B WAREHOUSE			1906.

Packed: 1 Cartons Weight: 110 lbs.

I certify the above to be true and correct.

MORRIS ROTHENBERG & SON, INC.

ALL QUOTATIONS SUBJECT TO PRIOR SALE AND TO STENOGRAPHIC ERRORS WITHOUT NOTICE. AGREEMENTS ARE CONTINGENT UPON STRIKES, FIRES, ACCIDENTS SHORTAGE, EMBARGO OR EXTRAORDINARY CONDITIONS IMPOSED ON ACCOUNT OF CHANGES IN TARIFF OR IMPORT.

MCI SAFEfax 02/09/95 12:10 ET REF:1573 NYB 1573 FR:NATIONAL WESTMINSTER TO:5162348772 Page

MORRIS ROTHENBERG AND SON, INC
ATT: GINGER LALUMIA
25 RANICK ROAD
SMITHTOWN (N Y) 11787

FROM: NATIONAL WESTMINSTER BANK USA
OUR REF: NB 950209-002460-504
UNTESTED MESSAGE

#92526

ORIGINAL ADVICE
WE CREDITED YOUR ACCOUNT WITH US :

ACCOUNT: 2218203749 IT

AMOUNT: USD 1,901.65 USD

1901.65
A/C 5.
1906.65

VALUE DATE: FEB 09, 95

RELATED REFERENCE : 010TTS656225

ORDERING BANK : BANK OF TOKYO KANDA
P.O.BOX 140
KANDA
TOKYO (JAPAN)

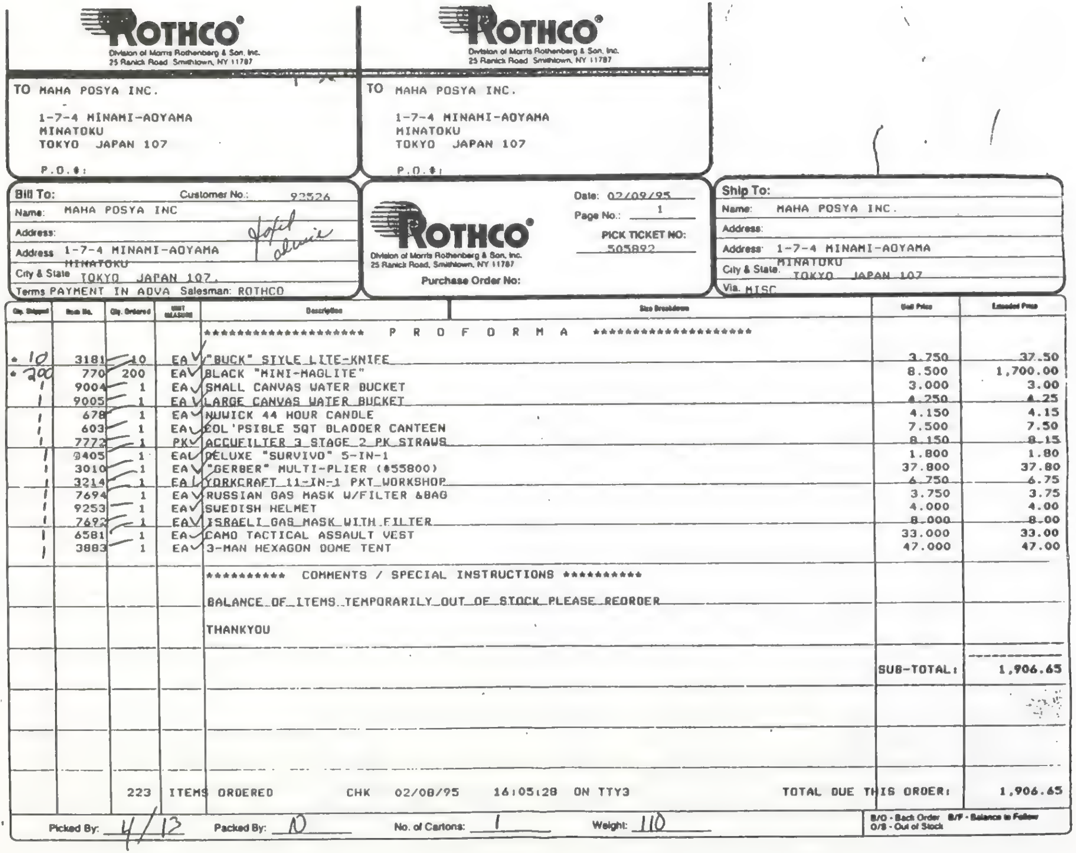
ORDERING CUSTOMER : DEVENIR MILLIONNAIRE INC.

FOR PAYMENT TO: MORRIS ROTHENBERG AND SON, INC
ATT: GINGER LALUMIA
25 RANICK ROAD
SMITHTOWN (N Y) 11787

DETAILS: 92526 / ROTHCO

SIGNATURE

REPLY TO: 62610 NBNA UW



ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road Smithtown, NY 11787

TO MAHA POSYA INC.

1-7-4 MINAMI-AOYAMA
MINATOKU
TOKYO JAPAN 107

P.O.#:

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road Smithtown, NY 11787

TO MAHA POSYA INC.

1-7-4 MINAMI-AOYAMA
MINATOKU
TOKYO JAPAN 107

P.O.#:

Bill To: Customer No.: 92526
Name: MAHA POSYA INC
Address:
Address 1-7-4 MINAMI-AOYAMA
MINATOKU
City & State TOKYO JAPAN 107.
Terms PAYMENT IN ADVA Salesman: ROTHCO

[illegible]

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787
Purchase Order No:

Date: 02/09/95
Page No.: 1
PICK TICKET NO: 505892

Ship To:
Name: MAHA POSYA INC.
Address:
Address 1-7-4 MINAMI-AOYAMA
MINATOKU
City & State TOKYO JAPAN 107
Via. MISC

Qty. Shipped	Item No.	Qty. Ordered	Unit Measure	Description	Size Breakdown	Unit Price	Extended Price
				********************** P R O F O R M A **********************			
• 10	3181	10	EA ✓	"BUCK" STYLE LITE-KNIFE		3.750	37.50
• 200	770	200	EA ✓	BLACK "MINI-MAGLITE"		8.500	1,700.00
1	9004	1	EA ✓	SMALL CANVAS WATER BUCKET		3.000	3.00
1	9005	1	EA ✓	LARGE CANVAS WATER BUCKET		4.250	4.25
1	678	1	EA ✓	NUWICK 44 HOUR CANDLE		4.150	4.15
1	603	1	EA ✓	COL'PSIBLE 5QT BLADDER CANTEEN		7.500	7.50
1	7772	1	PK ✓	ACCUFILTER 3 STAGE 2 PK STRAWS		8.150	8.15
1	9405	1	EA ✓	DELUXE "SURVIVO" 5-IN-1		1.800	1.80
1	3010	1	EA ✓	"GERBER" MULTI-PLIER (#55800)		37.800	37.80
1	3214	1	EA ✓	YORKCRAFT 11-IN-1 PKT WORKSHOP		6.750	6.75
1	7694	1	EA ✓	RUSSIAN GAS MASK W/FILTER &BAG		3.750	3.75
1	9253	1	EA ✓	SWEDISH HELMET		4.000	4.00
1	7692	1	EA ✓	ISRAELI GAS MASK WITH FILTER		8.000	8.00
1	6581	1	EA ✓	CAMO TACTICAL ASSAULT VEST		33.000	33.00
1	3883	1	EA ✓	3-MAN HEXAGON DOME TENT		47.000	47.00
				*********** COMMENTS / SPECIAL INSTRUCTIONS ***********			
				BALANCE OF ITEMS TEMPORARILY OUT OF STOCK PLEASE REORDER			
				THANKYOU			
						SUB-TOTAL:	1,906.65
		223	ITEMS ORDERED	CHK 02/08/95 16:05:28 ON TTY3		TOTAL DUE THIS ORDER:	1,906.65

Picked By: 4/12 Packed By: D No. of Cartons: 1 Weight: 110

B/O - Back Order B/F - Balance to Follow
O/S - Out of Stock

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787 0986

(516) 234-8000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

FAX TO: MAHA POSYA
JAPAN

DATE: FEBRUARY 16, 1995 PAGE 1 OF 3

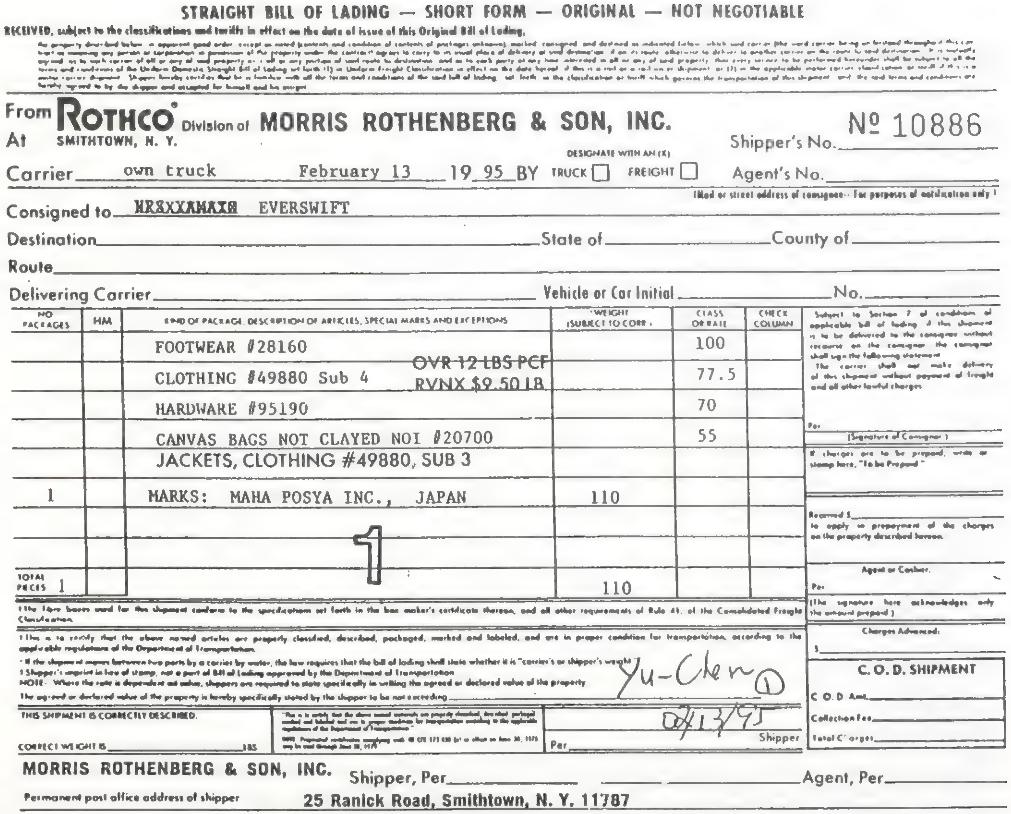
FOLLOWING IS COPY OF INVOICE/PACKING LIST COVERING YOUR ORDER. ALSO PLEASE SEE COPY OF ORIGINAL BILL OF LADING INDICATING THAT YOUR FORWARDER EVERSWIFT, PICKED UP THIS MERCHANDISE ON FEBRUARY 13. SINCE THEY CONTACTED US, WE HAVE NO RECORD OF THEIR PHONE NUMBER.

MAY WE SUGGEST IN THE FUTURE THAT YOU USE UPS YAMATO AS YOUR FREIGHT FORWARDER. WE HAVE FOUND THEIR RATES TO BE COMPETITIVE, AND THEIR SERVICE TO BE EXCELLENT.

IF THERE IS ANYTHING FURTHER WE CAN DO FOR YOU, PLEASE CONTACT ME.

RGDS.
GINGER LALUMIA

I HAVE TRIED AGAIN TO REACH YOUR FORWARDER AT THE 201 AREA CODE, AS YOU SUGGESTED. THERE IS NO PHONE LISTING FOR THIS COMPANY IN THAT AREA, OR IN 212, 718, OR 516. IF YOU WILL ADVISE ME OF THE PHONE NUMBER, I WILL CONTACT FORWARDER TOMORROW AND GET FLIGHT INFORMATION FOR YOU. AS I SUGGESTED ABOVE, PERHAPS IN THE FUTURE YOU WOULD DO BETTER WITH A LARGER, MORE EXPERIENCED FORWARDER SUCH AS UPS YAMATO.



STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — NOT NEGOTIABLE

RECEIVED, subject to the classifications and tariffs in effect on the date of issue of this Original Bill of Lading,

From **ROTHCO**® Division of **MORRIS ROTHENBERG & SON, INC.** № 10886

At SMITHTOWN, N. Y.

Shipper's No.

Carrier own truck February 13 19 95 BY DESIGNATE WITH AN (X) TRUCK ☐ FREIGHT ☐ Agent's No.

(Mail or street address of consignee— For purposes of notification only)

Consigned to HRSXXAMAXB EVERSWIFT

Destination State of County of

Route

Delivering Carrier Vehicle or Car Initial No.

NO PACKAGES	HM	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (SUBJECT TO CORR.)	CLASS OR RATE	CHECK COLUMN
		FOOTWEAR #28160		100	
		CLOTHING #49880 Sub 4 OVR 12 LBS PCF RVNX $9.50 LB		77.5	
		HARDWARE #95190		70	
		CANVAS BAGS NOT CLAYED NOI #20700		55	
		JACKETS, CLOTHING #49880, SUB 3			
1		MARKS: MAHA POSYA INC., JAPAN	110		
		1			
TOTAL PIECES 1			110		

Subject to Section 7 of conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Per

(Signature of Consignor.)

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier.

Per

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$

C. O. D. SHIPMENT

C. O. D. Amt.

Collection Fee

Total Charges

†The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41, of the Consolidated Freight Classification.

†This is to certify that the above named articles are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation.

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."

‡Shipper's imprint in lieu of stamp, not a part of Bill of Lading approved by the Department of Transportation.

NOTE: Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

Yu-Chen ①

THIS SHIPMENT IS CORRECTLY DESCRIBED.

CORRECT WEIGHT IS LBS.

02/13/95

Shipper

Per

MORRIS ROTHENBERG & SON, INC. Shipper, Per Agent, Per

Permanent post office address of shipper 25 Ranick Road, Smithtown, N. Y. 11787

MILTON SOMBERG – PRES.
(516) 234-8000

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
P.O. BOX [illegible]
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787

National: (800) 645-519
FAX: (516) 234-877

DATE: 02/09/95

PAGE: 1

INVOICE NO.: L005689

92526

SOLD TO
MAHA POSYA INC
1-7-4 MINAMI-AOYAMA
MINATOKU
TOKYO JAPAN 107,

SHIP TO
MAHA POSYA INC.
1-7-4 MINAMI-AOYAMA
MINATOKU
TOKYO JAPAN 107

UPS Yamato

PLEASE DETACH AND RETURN WITH YOUR REMITTANCE

********* EXPORT *******

P.O. No.	SHIPPING NO.	SHIPPED VIA:	No. PKGS	TERMS:
		MISC	1	PAYMENT IN ADVANCE

ITEM NO.	ITEM DESCRIPTION	QUANTITY	U/M	PRICE	EXTENSIO
* 3181	"BUCK" STYLE LITE-KNIFE	10	EA	3.75	37.
* 770	BLACK "MINI-MAGLITE"	200	EA	8.50	1,700.
9004	SMALL CANVAS WATER BUCKET	1	EA	3.00	3.
9005	LARGE CANVAS WATER BUCKET	1	EA	4.25	4.
678	NUWICK 44 HOUR CANDLE	1	EA	4.15	4.
603	COL'PSIBLE 5QT BLADDER CANTEEN	1	EA	7.50	7.
7772	ACCUFILTER 3 STAGE 2 PK STRAWS	1	PKG	8.15	8.
8405	DELUXE "SURVIVO" 5-IN-1	1	EA	1.80	1.
3010	"GERBER" MULTI-PLIER (#55800)	1	EA	37.80	37.
3214	YORKCRAFT 11-IN-1 PKT WORKSHOP	1	EA	6.75	6.
7694	RUSSIAN GAS MASK W/FILTER &BAG	1	EA	3.75	3.
9253	SWEDISH HELMET	1	EA	4.00	4.
7692	ISRAELI GAS MASK WITH FILTER	1	EA	8.00	8.
6581	CAMO TACTICAL ASSAULT VEST	1	EA	33.00	33.
3883	3-MAN HEXAGON DOME TENT	1	EA	47.00	47.
	PLEASE INDICATE ACCOUNT # AND INVOICE # ON YOUR REMITTANCE				
				TOTAL:	1,906.

ROTHCO®

ALL CLAIMS MUST BE MADE WITHIN FIVE DAYS AFTER RECEIPT OF GOODS.
MERCHANDISE WILL NOT BE ACCEPTED FOR RETURN WITHOUT
OUR WRITTEN CONSENT AND MUST BE FREIGHT PREPAID.

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

(516) 234-6000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

FAX TO: DEVENIR MILLIONNAIRE, INC.
ATT: TUSYOSHI MAKI

DATE: FEB. 6, 1995 PAGE 1 OF 1

IN REFERENCE TO YOUR FAX, HERE IS THE PRICE & AVAILABILITY ON THE FOLLOWING ITEMS;

ITEM #	PRICE	DELIVERY
3181	$3.75	IMMEDIATE
770	8.50	IMMEDIATE
762	9.15	2 WEEKS
764	9.15	IMMEDIATE
765	9.15	IMMEDIATE
9004	3.00	IMMEDIATE
9005	4.25	IMMEDIATE
8370	N/A	
678	4.15	IMMEDIATE
603	7.50	IMMEDIATE
7772	8.15	IMMEDIATE
7782	15.10	2-3 WEEKS
8405	1.80	IMMEDIATE
3010	37.80	IMMEDIATE
3214	6.75	IMMEDIATE
7694	3.75	IMMEDIATE
9253	4.00	IMMEDIATE
4862	N/A	
6580	31.00	LATE MARCH DELIVERY

IF YOU HAVE ANY QUESTIONS OR NEED SAMPLES, PLEASE CONTACT ME.

RGDS,
CHARLES MOORE

2-6-95

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0988

(516) 234-8000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

FAX TO: Devenir Millionnaire Inc

DATE: Feb 6 1995 PAGE 1 OF 1

Dear Tsuyoshi

In reference to your fax, here is the price + Availability on the following items,

	Price	Delivery
#3181 –	3.75	IMMEDIATE
#770 –	8.50	"
#762	9.15	2 weeks
#764	9.15	Immediate
#765	9.15	Immediate
#9004	3.00	"
#9005	4.25	"
#8370	N/A	—
#678	4.15	IMMEDIATE
#603	7.50	"
#7772	8.15	"
#7782	15.10	2 - 3 weeks
#8405	1.80	IMMED.
#3010	37.80	"
#3214	6.75	"
#7694	3.75	"
#9253	4.00	"
#4862	N/A	—
#6580	31.00	LATE MARCH Delivery

IF YOU HAVE ANY QUESTIONS OR NEED SAMPLES
Please contact me

Best RGDS
C MOORE

[redacted]

[illegible] 12:56 [illegible] 5280 6442

株式会社ドゥブニールミリオネール
DEVENIR MILLIONNAIRE INC.

〒102 東京都千代田区神田錦町３－１７－１４　北の丸ビル５階
5f Kitanomaru Bldg. 3-17-14 KandaNishiki-cho, Chiyoda-ku, Tokyo 102, Japan
TEL:03-3259-8439. FAX:03-5280-6442

TO : RothCo
ATTN : MR. CHARLES MOORE
FROM: Tsuyoshi MAKI
DATE: 6th / Feb / 95'

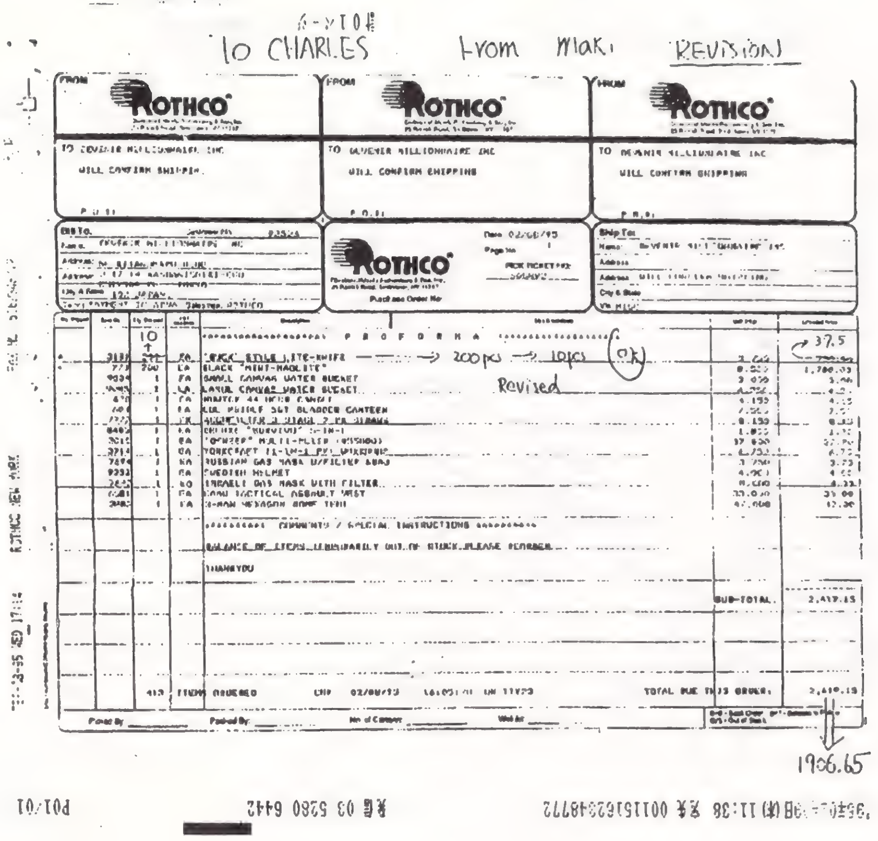
Hello How are you? after Big winning of 49ers? I had a chance to stop by your booth at Reno Convent. Now I'm back in Japan, seeing the catalogue what I can do. I have inquiries as follows

		Q'TY	PRICE	DELivery
1)	3181, Military Style lite KNIFE	200Pcs	?	?
MAG Lite 2)	770, 762, 764, 765 50×4 Kinds or 200×1 Kinds	200PCS	?	?
3)	9004, 9005 Water Bucket	We like to see samples.		
4)	8370 Poncho LineR			
5)	678 NuWick CANDLE			
6)	603 CollapsiBLE 5 Quart			
7)	7772 & 7782 AccuFilter			
8)	8405 Deluxe "SURVIVO"			
9)	3010 GERBER multi PLiER			
10)	3214 YorKCRAFT 11-iN-1			
11)	7694 RUSSIAN Gas MASK			
12)	7692-7693 set			
13)	9253 SWEDISH GI HELMET			
14)	4862 NYLON Poncho			
15)	6580 TACTICAL Assault Vests			

Let me Know your Quotation & Delivery time.

Thanks & Regards

計01ページ



計01ページ

TO CHARLES from Maki REVISION

FROM ROTHCO

TO DEVENIR MILLIONAIRE INC

WILL CONFIRM SHIPPING

F.O.B.

Bill To: Customer No. 23524
Name: DEVENIR MILLIONAIRE INC
Address: [illegible]
Address: [illegible]
City & State: [illegible] JAPAN
Terms: [illegible] Salesman: ROTHCO

ROTHCO
Date 02/08/95
Page No. 1
PICK TICKET NO. [illegible]
Purchase Order No.

Ship To:
Name: DEVENIR MILLIONAIRE INC
Address:
Address: WILL CONFIRM SHIPPING
City & State
Via: [illegible]

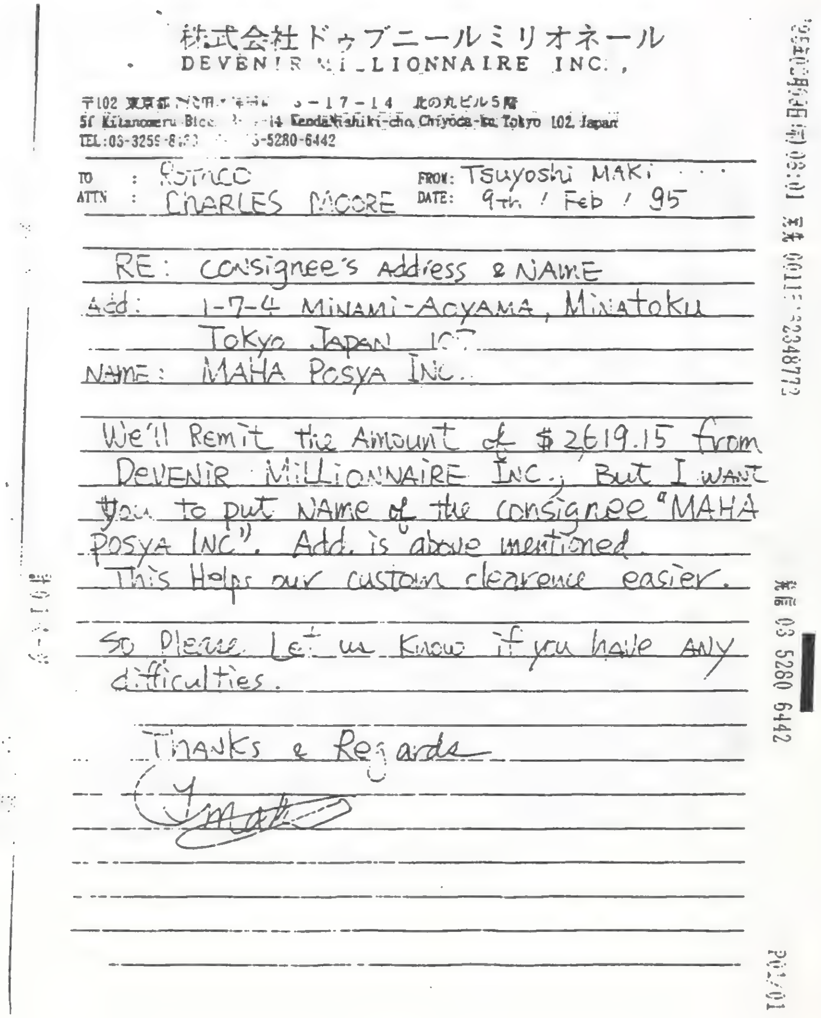
Qty Shipped	Item No.	Qty Ordered	Unit	Description	Unit Price	Extended Price
				******************** P R O F O R M A ********************		
	[illegible]	10 ↑ ~~375~~	EA	"RICK" STYLE LITE-KNIFE → 200pcs → 10pcs (OK) Revised	[illegible]	37.5 ↶ [illegible]
	[illegible]	200	EA	BLACK "MINI-MAGLITE"	[illegible]	1,700.00
	[illegible]	1	EA	SMALL CANVAS WATER BUCKET	[illegible]	[illegible]
	[illegible]	1	EA	LARGE CANVAS WATER BUCKET	[illegible]	[illegible]
	[illegible]	1	EA	[illegible] 44 INCH [illegible]	4.150	[illegible]
	[illegible]	1	EA	[illegible] SET BLADDER CANTEEN	[illegible]	[illegible]
	[illegible]	1	[illegible]	[illegible] 2 STAGE 2 PC [illegible]	8.150	[illegible]
	8402	1	EA	CHROME "SURVIVAL" 3-IN-1	[illegible]	[illegible]
	[illegible]	1	EA	[illegible] MULTI-PLIER [illegible]	[illegible]	[illegible]
	[illegible]	1	EA	[illegible]	[illegible]	[illegible]
	[illegible]	1	EA	RUSSIAN GAS MASK W/FILTER BAG	3.750	3.75
	9232	1	EA	SWEDISH HELMET	[illegible]	[illegible]
	[illegible]	1	EA	ISRAELI GAS MASK WITH FILTER	[illegible]	[illegible]
	[illegible]	1	EA	[illegible] TACTICAL ASSAULT VEST	33.000	33.00
	[illegible]	1	EA	[illegible]-MAN HEXAGON DOME TENT	[illegible]	[illegible]
				********** COMMENTS / SPECIAL INSTRUCTIONS **********		
				BALANCE OF ITEMS TEMPORARILY OUT OF STOCK.PLEASE REORDER.		
				THANKYOU		
					SUB-TOTAL.	2,41?.15
		413		ITEMS ORDERED [illegible] 02/08/95 [illegible]	TOTAL DUE THIS ORDER:	2,41?.15

Picked By ______ Packed By: ______ No. of Cartons ______ Weight ______

1906.65

[illegible]-3-95 WED 17:14 ROTHCO NEW YORK [illegible]

'95年0[illegible]月[illegible]9日(木) 11:38 宛先 00115162348772 発信 03 5280 6442 [redacted] P01/01



株式会社ドゥブニールミリオネール
DEVENIR MILLIONNAIRE INC.,

〒102 東京都 [illegible] 3－17－14 北の丸ビル5階
5F Kitanomaru Bldg. [illegible] -14 Kandanishiki-cho, Chiyoda-ku, Tokyo 102 Japan
TEL: 03-3259-8[illegible] [illegible] 5-5280-6442

TO : ROTACC
ATTN : CHARLES MOORE
FROM: Tsuyoshi MAKI
DATE: 9th / Feb / 95

RE: consignee's Address & NAME
Add: 1-7-4 MINAMI-AOYAMA, MINATOKU
TOKYO JAPAN 107
NAME: MAHA POSYA INC.

We'll Remit the Amount of $2619.15 from DEVENIR MILLIONNAIRE INC., But I WANT you to put NAME of the consignee "MAHA POSYA INC". Add. is above mentioned. This Helps our custom clearence easier.

So Please Let us Know if you have ANY difficulties.

Thanks & Regards

T. Maki

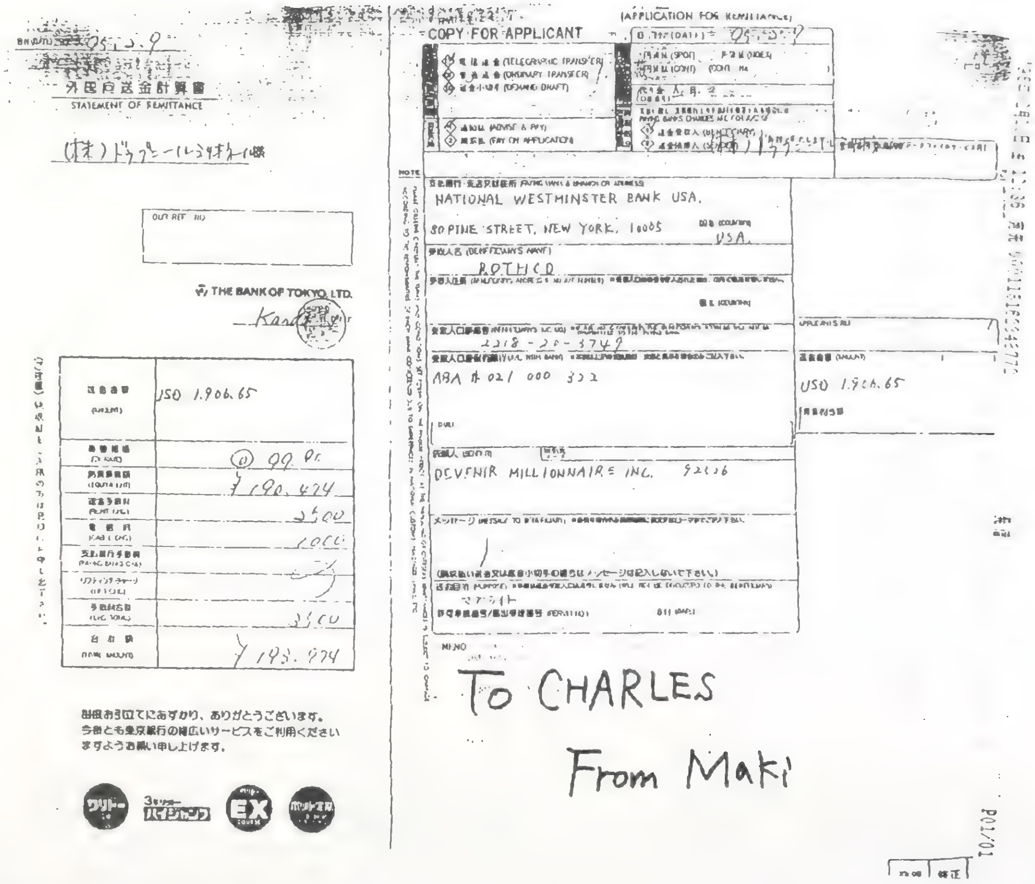
[illegible] 08:01 宛先 0011[illegible] 2348772

発信 03 5280 6442 [redacted]

P01/01

NEED TO CHANGE NAME

REPRINT - SEND NEW PROFORMA



BN (D/T) 05.3.9

外国向送金計算書
STATEMENT OF REMITTANCE

(株)ドゥブニールミリオネー様

OUR REF. NO.

THE BANK OF TOKYO, LTD.

Kanda

送金金額 (AMOUNT)	USD 1.906.65
為替相場 (FX RATE)	① 99.90
邦貨換算額 (EQUIVALENT)	¥190.474
送金手数料 (REMIT. CHG.)	2500
電信料 (CABLE CHG.)	1000
支払銀行手数料 (PAYING BANK'S CHG.)	—
リフティングチャージ (LIFTING)	
手数料合計 (CHG. TOTAL)	3500
合計額 (TOTAL AMOUNT)	¥193.974

毎度お引立てにあずかり、ありがとうございます。
今後とも東京銀行の幅広いサービスをご利用くださいますようお願い申し上げます。

(APPLICATION FOR REMITTANCE)

COPY FOR APPLICANT

日付 (DATE) 05.3.9

- ① 電信送金 (TELEGRAPHIC TRANSFER)
- ② 普通送金 (ORDINARY TRANSFER)
- ③ 送金小切手 (DEMAND DRAFT)

- ① 通知払 (ADVISE & PAY)
- ② 請求払 (PAY ON APPLICATION)

直物 (SPOT)
予約 (CONT)

支払銀行手数料 PAYING BANK'S CHARGES ARE FOR A/C OF
- ① 送金受取人 (BENEFICIARY)
- ② 送金依頼人 (SENDER)

NOTE

支払銀行・支店又は住所 PAYING BANK & BRANCH OR ADDRESS
NATIONAL WESTMINSTER BANK USA.
80 PINE STREET, NEW YORK, 10005
国名 (COUNTRY) USA.

受取人名 (BENEFICIARY'S NAME)
ROTHCO

受取人住所 (BENEFICIARY'S ADDRESS)
国名 (COUNTRY)

受取人口座番号 (BENEFICIARY'S AC. NO.)
2218-20-3749

受取人口座銀行 (A/C WITH BANK)
ABA # 021 000 322

依頼人 (SENDER)
DEVENIR MILLIONNAIRE INC. 92126

送金金額 (AMOUNT)
USD 1.906.65

メッセージ (MESSAGE TO BENEFICIARY)
(電信送金又は送金小切手の場合はメッセージは記入しないで下さい)

送金目的 (PURPOSE)
マガライト

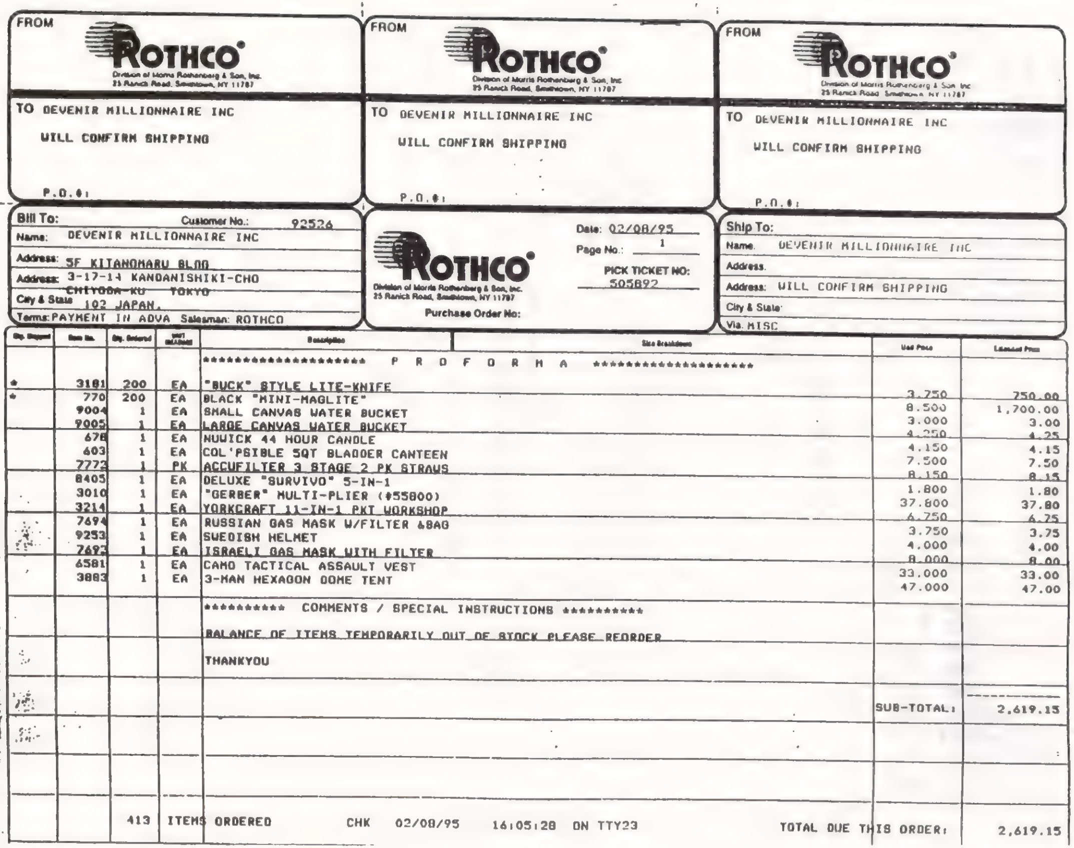
許可承認番号/輸出承認番号 (PERMIT NO.)

MEMO

To CHARLES

From Maki

P01/01



FROM
ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787

TO DEVENIR MILLIONNAIRE INC
WILL CONFIRM SHIPPING

P.O.#:

FROM
ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787

TO DEVENIR MILLIONNAIRE INC
WILL CONFIRM SHIPPING

P.O.#:

FROM
ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787

TO DEVENIR MILLIONNAIRE INC
WILL CONFIRM SHIPPING

P.O.#:

Bill To: Customer No.: 92526
Name: DEVENIR MILLIONNAIRE INC
Address: 5F KITANOMARU BLDG
Address: 3-17-14 KANDANISHIKI-CHO
CHIYODA-KU TOKYO
City & State 102 JAPAN.
Terms: PAYMENT IN ADVA Salesman: ROTHCO

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787
Purchase Order No:

Date: 02/08/95
Page No.: 1
PICK TICKET NO: 505892

Ship To:
Name: DEVENIR MILLIONNAIRE INC
Address:
Address: WILL CONFIRM SHIPPING
City & State:
Via. MISC

Qty. Shipped	Item No.	Qty. Ordered	Unit Measure	Description	Size Breakdown	Unit Price	Extended Price
				******************** P R O F O R M A ********************			
*	3181	200	EA	"BUCK" STYLE LITE-KNIFE		3.750	750.00
*	770	200	EA	BLACK "MINI-MAGLITE"		8.500	1,700.00
	9004	1	EA	SMALL CANVAS WATER BUCKET		3.000	3.00
	9005	1	EA	LARGE CANVAS WATER BUCKET		4.250	4.25
	678	1	EA	NUWICK 44 HOUR CANDLE		4.150	4.15
	603	1	EA	COL'PSIBLE 5QT BLADDER CANTEEN		7.500	7.50
	7772	1	PK	ACCUFILTER 3 STAGE 2 PK STRAWS		8.150	8.15
	8405	1	EA	DELUXE "SURVIVO" 5-IN-1		1.800	1.80
	3010	1	EA	"GERBER" MULTI-PLIER (#55800)		37.800	37.80
	3214	1	EA	YORKCRAFT 11-IN-1 PKT WORKSHOP		6.750	6.75
	7694	1	EA	RUSSIAN GAS MASK W/FILTER &BAG		3.750	3.75
	9253	1	EA	SWEDISH HELMET		4.000	4.00
	7697	1	EA	ISRAELI GAS MASK WITH FILTER		8.000	8.00
	6581	1	EA	CAMO TACTICAL ASSAULT VEST		33.000	33.00
	3883	1	EA	3-MAN HEXAGON DOME TENT		47.000	47.00
				********** COMMENTS / SPECIAL INSTRUCTIONS **********			
				BALANCE OF ITEMS TEMPORARILY OUT OF STOCK PLEASE REORDER			
				THANKYOU			
						SUB-TOTAL:	2,619.15
		413	ITEMS	ORDERED CHK 02/08/95 16:05:28 ON TTY23		TOTAL DUE THIS ORDER:	2,619.15

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

(516) 234-8000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

FAX TO: DEVENIR MILLIONNAIRE
ATT: TUSYOSHI MAKI

DATE: FEBRUARY 8, 1995 PAGE 1 OF 2

FOLLOWING IS PROFORMA INVOICE FOR YOUR ORDER. PLEASE REMIT $2,619.15 TO OUR ACCOUNT NUMBER 2218 20 3749 AT NATIONAL WESTMINSTER BANK USA, 80 PINE STREET, NEW YORK, NEW YORK 10005, ABA #021 000 322.

PLEASE HAVE YOUR BANK INCLUDE YOUR ACCOUNT NAME AND ROTHCO CUSTOMER NUMBER ON THE TRANSFER, SO THAT WE CAN PROPERLY CREDIT YOUR ACCOUNT.

UPON RECEIPT OF FAXED COPY OF WIRE TRANSFER, WE WILL EXPEDITE YOUR ORDER.

RGDS.
CHARLES MOORE

ROTHCO
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

(516) 234-8000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

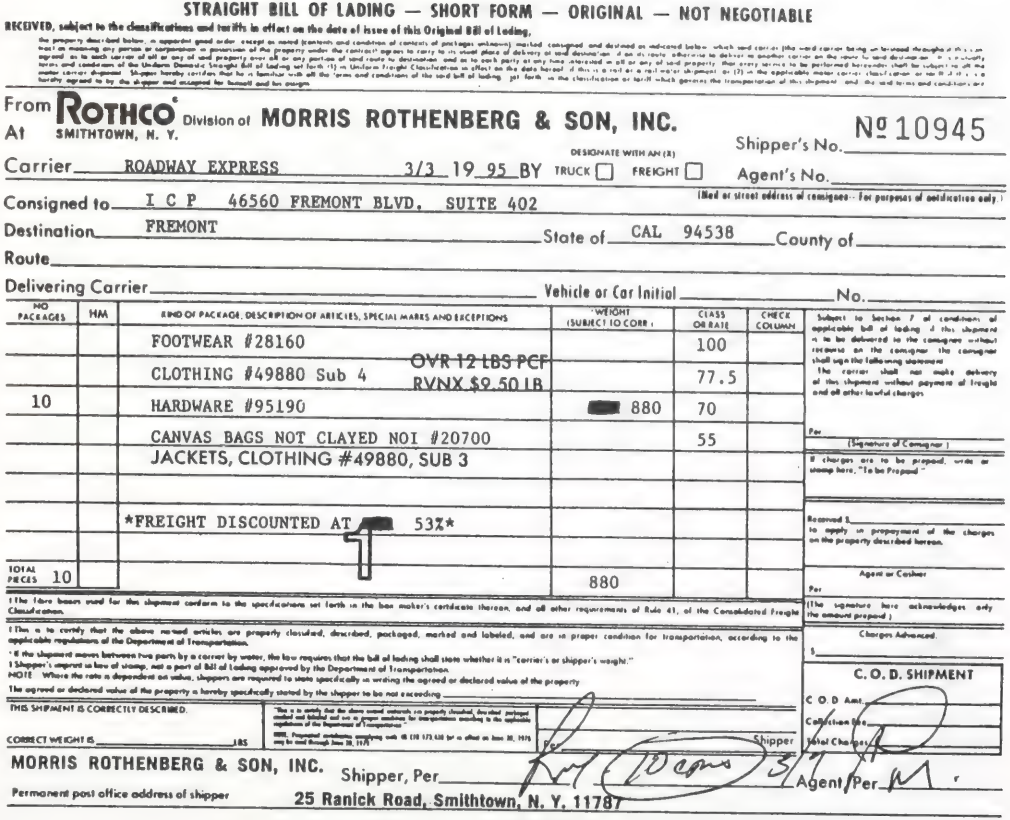
FAX TO: I C P

DATE: MARCH 3, 1995 PAGE 1 OF 2

ENCLOSED PLEASE FIND INVOICE/PACKING LIST COVERING 10 CARTONS SHIPPED TO YOU TODAY VIA ROADWAY EXPRESS.

RGDS,
HOWARD SOMBERG

3-3-95



STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — NOT NEGOTIABLE

RECEIVED, subject to the classifications and tariffs in effect on the date of issue of this Original Bill of Lading,

From **ROTHCO** Division of **MORRIS ROTHENBERG & SON, INC.**
At SMITHTOWN, N. Y.

№ 10945
Shipper's No.

Carrier ROADWAY EXPRESS 3/3 19 95 BY DESIGNATE WITH AN (X) TRUCK ☐ FREIGHT ☐ Agent's No.

Consigned to I C P 46560 FREMONT BLVD. SUITE 402 (Mail or street address of consignee—For purposes of notification only.)

Destination FREMONT State of CAL 94538 County of

Route

Delivering Carrier Vehicle or Car Initial No.

NO. PACKAGES	HM	KIND OF PACKAGE, DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (SUBJECT TO CORR.)	CLASS OR RATE	CHECK COLUMN
		FOOTWEAR #28160		100	
		CLOTHING #49880 Sub 4 ~~OVR 12 LBS PCF~~ RVNX $9.50 LB		77.5	
10		HARDWARE #95190	[redacted] 880	70	
		CANVAS BAGS NOT CLAYED NOI #20700 JACKETS, CLOTHING #49880, SUB 3		55	
		FREIGHT DISCOUNTED AT [redacted] 53%			
		1			
TOTAL PIECES 10			880		

†The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41, of the Consolidated Freight Classification.

†This is to certify that the above named articles are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation.

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."

‡ Shipper's imprint in lieu of stamp, not a part of Bill of Lading approved by the Department of Transportation.

NOTE Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

THIS SHIPMENT IS CORRECTLY DESCRIBED.

CORRECT WEIGHT IS ______ LBS

Per Shipper

10 cons 3/

MORRIS ROTHENBERG & SON, INC. Shipper, Per

Permanent post office address of shipper 25 Ranick Road, Smithtown, N. Y. 11787

Agent/Per

Subject to Section 7 of conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Per

(Signature of Consignor.)

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $
to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$

C. O. D. SHIPMENT

C. O. D. Amt.

Collection Fee

Total Charges

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

(516) 234-8000
National Toll Free
(800) 645-5195
Fax: (516) 234-8772

FAX TO: T. MAKI

DATE: MARCH 16, 1995 PAGE 1 OF 1

PLEASE BE ADVISED THAT ORDER SHIPPED TO ICP IN FREMONT, CAL VIA ROADWAY EXPRESS IS DUE TO BE DELIVERED THERE TODAY.

RGDS,
HOWARD SOMBERG

3-16-95

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 RANICK ROAD
SMITHTOWN, NEW YORK 11787-0986

Telephone
(516) 234-8000
National Toll Free
(800) 645-5195
FAX: (516) 234-8772

March 3, 1995

I C P
46560 FREMONT BOULEVARD
SUITE 402
FREMONT, CA 94538

Gentlemen:

Thank you for your recent order. We are pleased to enclose the invoice/packing list covering merchandise shipped.

Freight has been turned over to Roadway Express.

We trust your merchandise arrives promptly and in good order, and we look forward to the pleasure of hearing from you again.

Sincerely,

MORRIS ROTHENBERG & SON, INC.

Howard Somberg
Vice President

HS/jc
enclosure

FROM
ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787

TO I C P

46560 FREMONT BLVD
SUITE 402
FREMONT, CA 94538

P.O.#:

FROM
ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787

TO I C P

46560 FREMONT BLVD
SUITE 402
FREMONT, CA 94538

P.O.#:

FROM
ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787

TO I C P

46560 FREMONT BLVD
SUITE 402
FREMONT, CA 94538

P.O.#:

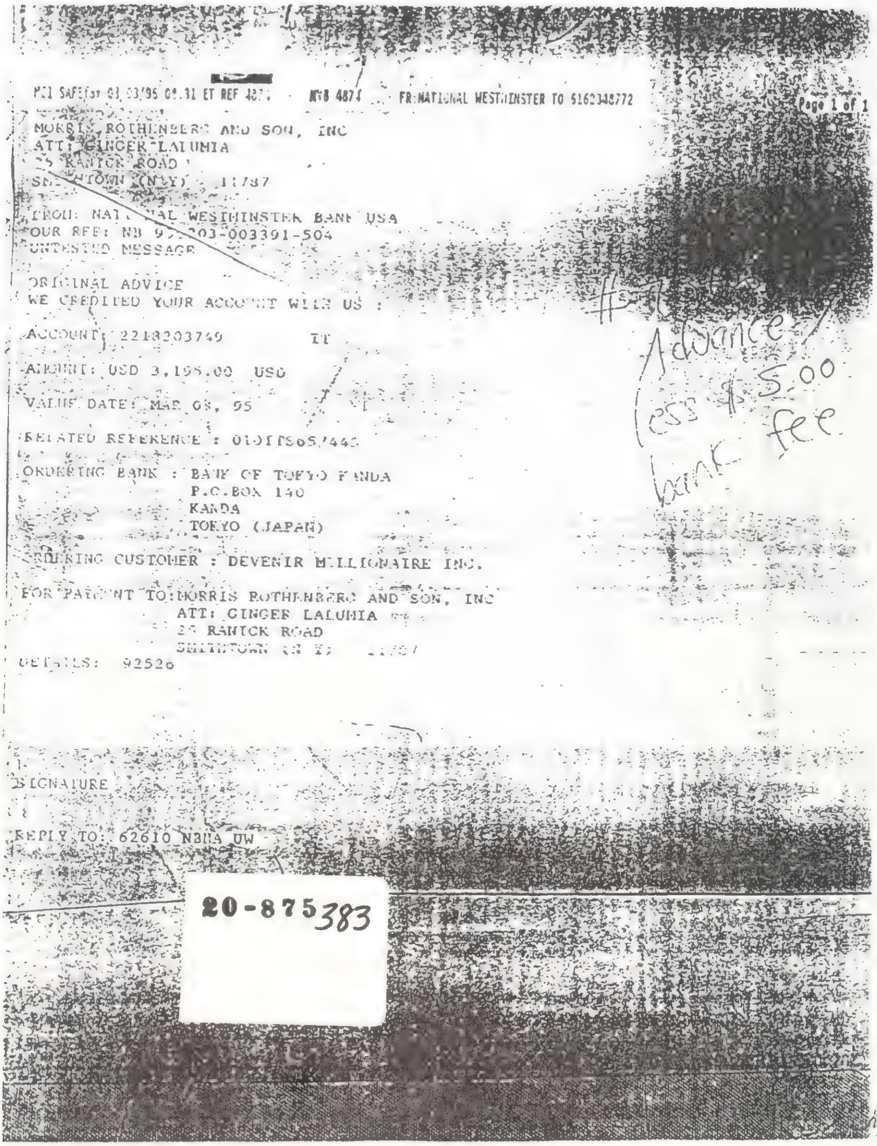
Bill To: Customer No.: 73406
Name: I C P
Address:
Address: 46560 FREMONT BLVD
SUITE 402
City & State FREMONT, CA 94538
Terms: PAYMENT IN ADVA Salesman: ROTHCO

ROTHCO®
Division of Morris Rothenberg & Son, Inc.
25 Ranick Road, Smithtown, NY 11787
Date: 03/02/95
Page No.: 1
PICK TICKET NO: 508913
Purchase Order No:

Ship To:
Name: I C P
Address:
Address: 46560 FREMONT BLVD
SUITE 402
City & State: FREMONT, CA 94538
Via: ROADUAY EXPRESS

Qty. Shipped	Item No.	Qty. Ordered	Unit Measure	Description	Size Breakdown	Unit Price	Extended Price
				********************* P R O F O R M A	*********************		
	7692	400	EA	ISRAELI GAS MASK WITH FILTER		8.000	3,200.00
						SUB-TOTAL:	3,200.00
		400	ITEMS	ORDERED HIS 03/02/95 07:31:14 ON TTY17	TOTAL DUE THIS ORDER:		3,200.00

Picked By: Packed By: No. of Cartons Weight: B/O - Back Order B/F - Balance to Follow



MCI SAFE(sr 03/03/95 09:31 ET REF 487 NWB 4874 FR:NATIONAL WESTMINSTER TO 5162348772 Page 1 of 1

MORRIS ROTHENBERG AND SON, INC
ATT: GINGER LALUMIA
25 RANICK ROAD
SMITHTOWN (N.Y.) 11787

FROM: NATIONAL WESTMINSTER BANK USA
OUR REF: NB 9[illegible]03-003391-504
UNTESTED MESSAGE

ORIGINAL ADVICE
WE CREDITED YOUR ACCOUNT WITH US :

ACCOUNT: 2218203749 TT

AMOUNT: USD 3,195.00 USD

VALUE DATE: MAR 03, 95

RELATED REFERENCE : 010ITS05/443

ORDERING BANK : BANK OF TOKYO KANDA
P.O.BOX 140
KANDA
TOKYO (JAPAN)

ORDERING CUSTOMER : DEVENIR MILLIONAIRE INC.

FOR PAYMENT TO:MORRIS ROTHENBERG AND SON, INC
ATT: GINGER LALUMIA
25 RANICK ROAD
SMITHTOWN (N.Y.) 11787
DETAILS: 92526

Advance/
less $5.00
bank fee

SIGNATURE

REPLY TO: 62610 NBNA UW

20-875383

202-394-6429

株式会社ドゥブニールミリオネール
DEVENIR MILLIONNAIRE INC.

〒101 東京都千代田区神田錦町３－１７－１４　北の丸ビル５階
5f Kitanomaru Bldg. 3-17-14 KandaNishiki-cho, Chiyoda-ku, Tokyo 102, Japan
TEL:03-3259-8439. FAX:03-5280-6442

TO : Rothco　　FROM: T. Maki
ATTN : H. Someberg　　DATE: 1st 'Mar ' 95'

RE: Shipping to California

Following is our agent in CA.

Consignee : ICP

Add: 46560 Fremont Blvd., Suite # 402
Fremont, CA 94538
T: 510-226-8290
F: -8293

Please send a Fax of Mask & Filter & 400 set of PI. ~~PI to TOKYO.~~

Normal package is OK

Thanks & Regards
T. Maki

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SOLD TO: I C P
46560 FREMONT BOULEVARD
SUITE 402
FREMONT

SHIP TO:

VIA: ROADWAY EXPRESS

DATE 03/02/95

PAGE:

ACCT.# 73406-L008483

P.O. #

TERMS: PAYMENT IN ADVANCE

BANK:

NUMBERS	CARTONS	EACH PACKING	TOTAL QUANTITY	DESCRIPTION	C.O.	UNIT PRICE	TOTAL
1-10	10	40	400	7692 FACE MASK	IL	8.00	3200.0
				F.O.B WAREHOUSE			3200.0
				Packed: 10 Cartons Weight: 880 lbs.			
				I certify the above to be true and correct.			
				MORRIS ROTHENBERG & SON, INC.			

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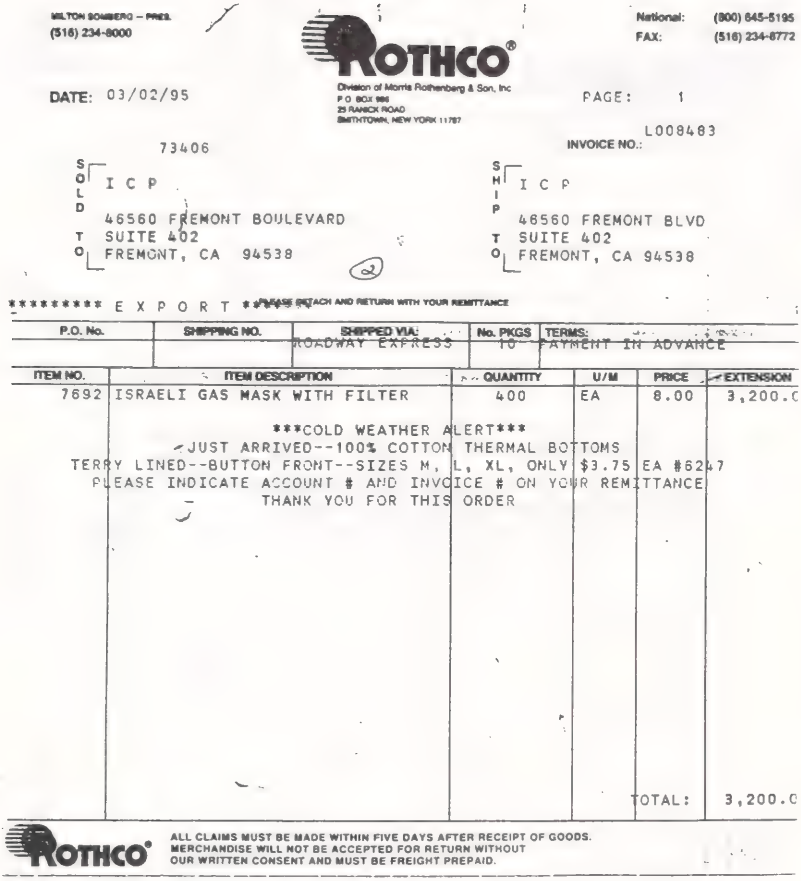

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(516) 234-8000

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National: (800) 645-5195
FAX: (516) 234-8772

DATE: 03/02/95

PAGE: 1

INVOICE NO.: L008483

73406

SOLD TO
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46560 FREMONT BOULEVARD
SUITE 402
FREMONT, CA 94538

SHIP TO
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SUITE 402
FREMONT, CA 94538

②

********* EXPORT ********* PLEASE DETACH AND RETURN WITH YOUR REMITTANCE

P.O. No.	SHIPPING NO.	SHIPPED VIA:	No. PKGS	TERMS:
		ROADWAY EXPRESS	10	PAYMENT IN ADVANCE

ITEM NO.	ITEM DESCRIPTION	QUANTITY	U/M	PRICE	EXTENSION
7692	ISRAELI GAS MASK WITH FILTER	400	EA	8.00	3,200.0
				TOTAL:	3,200.0

COLD WEATHER ALERT
--JUST ARRIVED--100% COTTON THERMAL BOTTOMS
TERRY LINED--BUTTON FRONT--SIZES M, L, XL, ONLY $3.75 EA #6247
PLEASE INDICATE ACCOUNT # AND INVOICE # ON YOUR REMITTANCE
THANK YOU FOR THIS ORDER

ROTHCO® ALL CLAIMS MUST BE MADE WITHIN FIVE DAYS AFTER RECEIPT OF GOODS. MERCHANDISE WILL NOT BE ACCEPTED FOR RETURN WITHOUT OUR WRITTEN CONSENT AND MUST BE FREIGHT PREPAID.

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FAX TO: DEVENIR MILLIONNAIRE INC.
ATT: T. MAKI

DATE: MARCH 2, 1995 PAGE 1 OF 2

THANK YOU FOR YOUR FAX. ENCLOSED PLEASE FIND PROFORMA INVOICE FOR ORDER GOING TO CALIFORNIA.

PLEASE REMIT $3,200.00 TO OUR ACCOUNT NUMBER 2218 20 3749 AT NATIONAL WESTMINSTER BANK USA ABA#021 000 322 AT 80 PINE STREET NEW YORK, NY 10005. PLEASE HAVE YOUR BANK INCLUDE ACCOUNT NUMBER AND NAME ON TRANSFER. UPON RECEIPT OF PAYMENT, SHIPMENT WILL BE MADE.

RGDS,
HOWARD SOMBERG

3-2-95

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Bill To: Customer No.: 73406
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Terms PAYMENT IN ADVA Salesman: ROTHCO

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25 Ranick Road, Smithtown, NY 11787
Purchase Order No:

Date 03/02/95
Page No.: 1
PICK TICKET NO: 508913

Ship To:
Name I C P
Address
Address 46560 FREMONT BLVD
SUITE 402
City & State FREMONT, CA 94538
Via. ROADWAY EXPRESS

B/H
10945

Qty. Shipped	Item No.	Qty. Ordered	Unit Measure	Description	Size Breakdown	Unit Price	Extended Price
				********************* P R O F O R M A	********************* send commercial invoice to Cal.		
400 ✓	7692	400	EA	ISRAELI GAS MASK WITH FILTER		8.000	3,200.00

						SUB-TOTAL:	3,200.00
				#1-10 40ea/ctn #7692			
		400	ITEMS ORDERED	HIS 03/02/95 07:31:14 ON TTY17	TOTAL DUE THIS ORDER:		3,200.00

Picked By: 16 Packed By: 1 No. of Cartons: 10 Weight: 880

B/O - Back Order B/F - Balance to Follow
O/S - Out of Stock

Senate Permanent Subcommittee
on Investigations
EXHIBIT # 22

International Tesla Society, Inc.
P.O. Box 5636
Colorado Springs, CO 80931
United States of America

(719) 475-0918
Fax 475-0582

October 24, 1995

Mr. Dan Gelber, Chief Counsel
Senate Investigations
Senator Nunn
Washington, D.C.
FAX 202-224-1972

RE: Aum USA Co. Ltd.

Dear Mr. Gelber:

Accompanying this cover letter is a copy of the complete file covering our brief contact in January of this year with Aum, et al. Our contact was limited to telephone conversations of limited duration, a membership and an order for general books on the life and inventions of Nikola Tesla, his patents which are public domain, as well as his writings. None of us remember these conversations We are providing this information without Summons to, hopefully, help in this investigation.

As you will see, our contact was with a Ms. Yumiko Hiraoka, but nothing in this communication indicates where they heard of our Society. I believe that this may have been a "fishing" expedition on her part for information deemed valuable to their way of thinking.

Further, for your information, concerning Tesla's work on resonating frequencies. As early as 1897/1898, he created an "earthquake" in New York City which he spoke about in an article for the *New York World-Telegram* on July 11, 1935. In February, 1912 an article in a New York Publication *The World Today* under the heading of "Nikola Tesla, Dreamer,", it was reported that Tesla attached a small, pocketable device to a steel superstructure of a building in the Wall Street district which caused the building to begin to sway. Reportedly, that building would have collapsed within 10 minutes if left there. It was further reported that by using the same device, he could have made the Brooklyn Bridge collapse in an hour. Tesla, himself, said he could create a device to "split the world" in two, using his technology. However, this was not the goal of Tesla, but rather his purpose was to use the earth, itself, as a transmitting device for radio as wall as electrical power. This concept he further developed in Colorado Springs in 1899 and later on Long Island. Perhaps it was for the former reason Aum was interested in Tesla.

Upon Tesla's death in 1943, the US government seized the vast majority of his papers and research notes. When members of the Society or others have requested information under FOIA from the archives, much has been "black penned" for national security reasons. However, in the 1930's Tesla developed a "ray" gun which was actually a particle beam accelerator which, again reportedly, could have "shot down an airplane at 200 miles."

Without question, Tesla grasped the imagination of a newly born technological world.

Page 2, Gelber
October 24, 1995

Today, however, we are left with bits and pieces of fact and fantasy, but we do know that the technology which he developed could well have been adapted to various weapons of mass destruction. It is only regrettable that the world does not recognize him for the genius he was, the man who brought us AC electricity, the Radio, computer technology and much more.

Lest I continue on, I trust the accompanying information will assist you in your investigation. Should you need any further information, please let me know and I will do what I can to garner it for you.

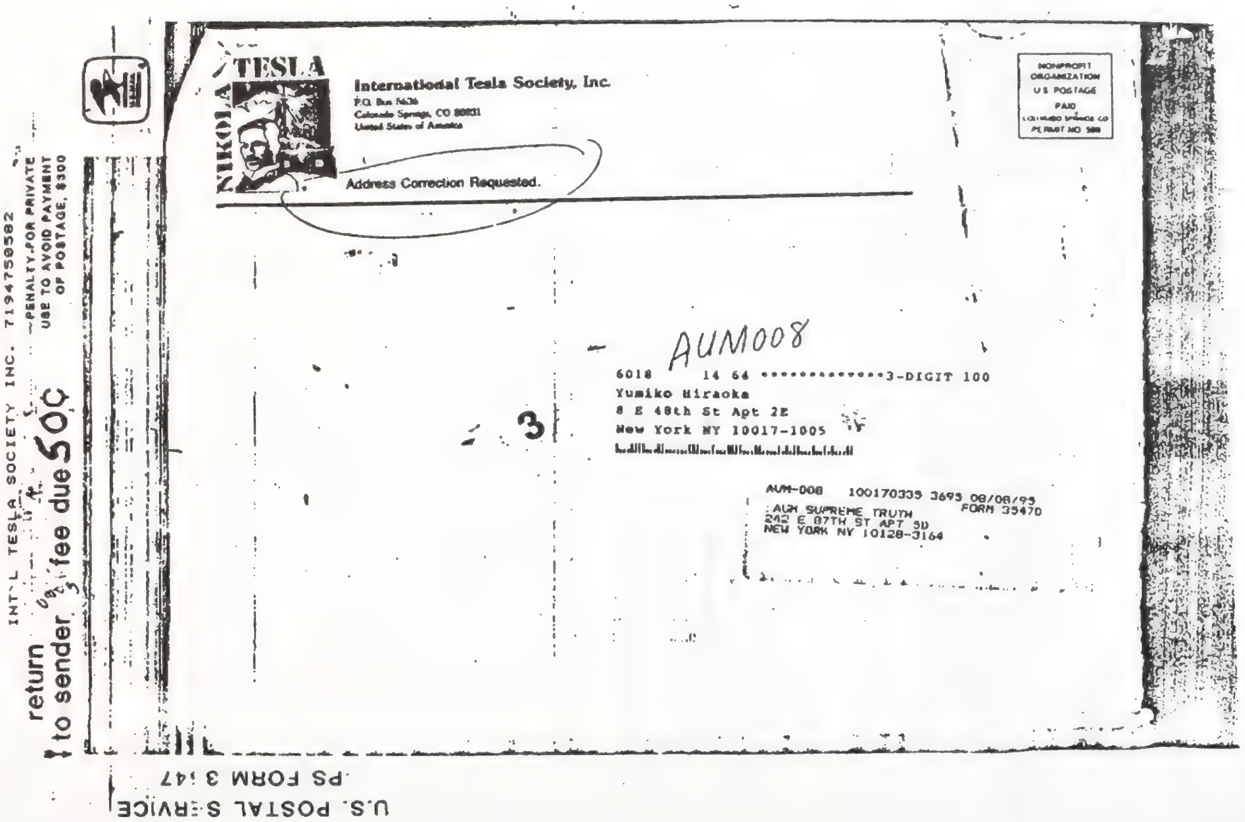
We trust your investigation will go well and it will accomplish the goals you have established.

Sincerely,

David H. Hanson, Director
The International Tesla Society, Inc.

DHH:aa

accompanying fax documents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P.O. Box 5636
Colorado Springs, CO 80931
United States of America

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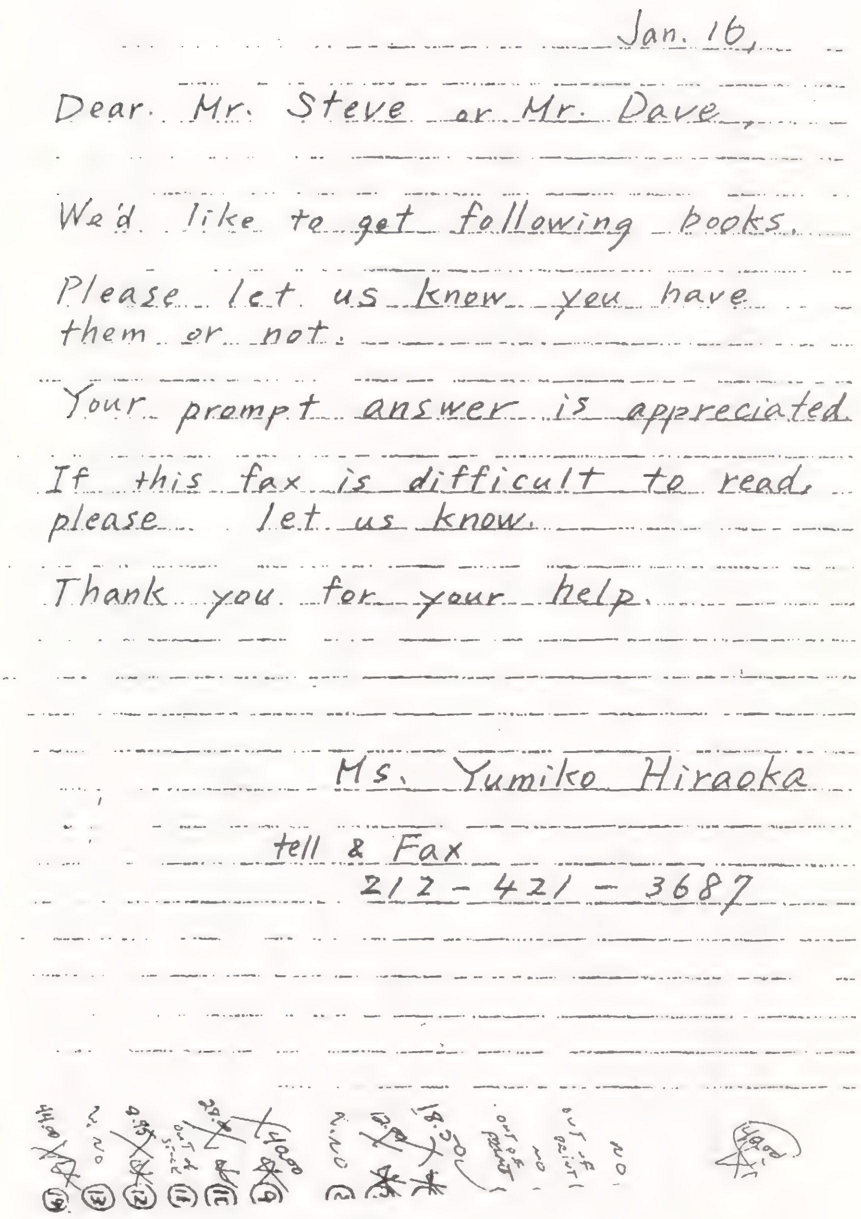

Jan. 16,

Dear Mr. Steve or Mr. Dave,

We'd like to get following books.

Please let us know you have them or not.

Your prompt answer is appreciated.

If this fax is difficult to read, please let us know.

Thank you for your help.

Ms. Yumiko Hiraoka

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① Anderson, Leland, ed., *Nikola Tesla on his Work with Alternating Currents and their Application to Wi*
Telegraphy, Telephony and Transmission of Power, Sun Publishing, 1992.

~~Cheney, Margaret, Tesla : Man out of Time, Prentice Hall, 1981.~~

NO ② Conot, Robert, *Thomas A. Edison : A Streak of Luck*, Da Capo Press, 1979.

out of print ③ Ford, Richard A., *Tesla Coils Secrets*, Lindsay Publications, 1985.

NO ④ Howe, Russell Warren, *Weapon*, Sphere Books Ltd., 1981.

out of print ⑤ Hunt, Inez & Draper, Wanetta, *Lightning in his Hand : A Biography of Nikola Tesla*, Omni Publicatio
1984.

18.50 ⑥ Martin, T. C., ed., *The Inventions, Researchs and Writings of Nikola Tesla*, Angriff Press, 1981.

12. ⑦ O'Neill, John J., *Prodigal Genius : The Life of Nikola Tesla*, Angriff Press, 1986.

N. NO ⑧ Popovic, Vojin, ed., *Nikola Tesla : Life and work of a Genius*, Yugoslav Society for the Promotion
Scientific Knowledge "Nikola Tesla", 1976.

40.00 ⑨ Ratzraff, John, ed., *Complete Patents of Tesla*, Gordon Press, 1986.

9. ⑩ Ratzraff, John, ed., *Tesla Said*, Tesla Book Company, 1984.

out of stock ⑪ Seifer, Marc J., *Tesla's Magnifying Transmitter*, 1986.

1.95 ⑫ Seifer, Marc J., *Nikola Tesla : The Man Who Harnessed Niagara Falls*, Meta Science Publications, 1991.

N. NO ⑬ Siegel, Mike, ed., *Hugo Gernsback : Father of Modern Science Fiction*, The Borgo Press, 1988.

1.00 ⑭ Tesla, Nikola, *Colorado Springs Notes 1899-1900*, Nolit, 1978.

3, NO

1986

Tesla, Nikola, *Experiments with A. C. & Transmission of Electric Energy Without Wires*, Angriff Press

Tesla, Nikola. *My Inventions : The Autobiography of Nikola Tesla.* Hart Brothers Publications, 1982.

Tesla, Nikola. *The Problem of Increasing Human Energy*. High Energy Enterprises. Inc., 1990.

Trinkaus, George. *Tesla Coil.* High Voltage Press. 1986.

Man out of Time Margaret Cheney

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INTERNATIONAL TESLA SOCIETY
P.O. Box 5636
Colorado Springs, CO 80931

January 23, 1995

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PO NUMBER:

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